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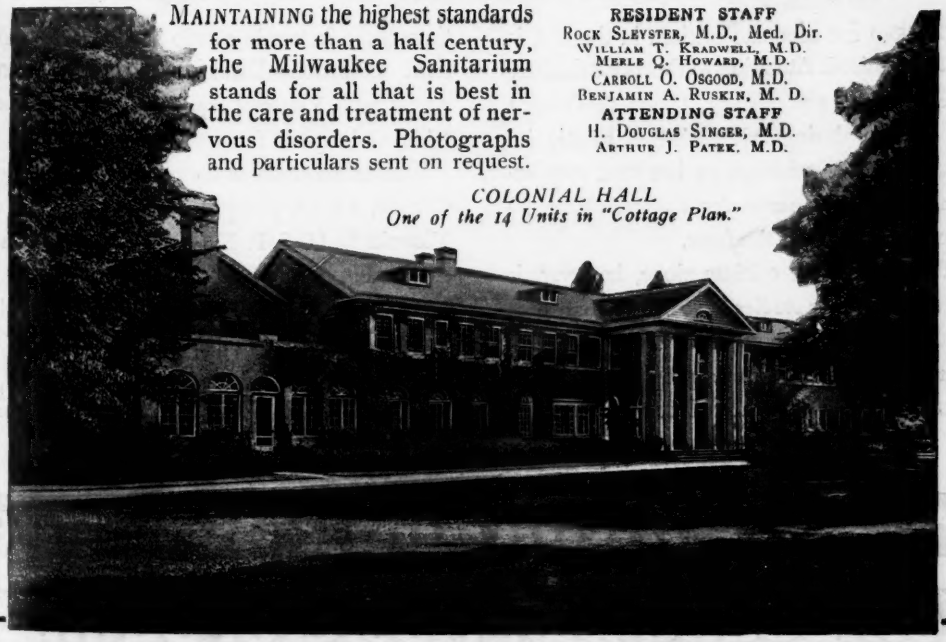

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ILLINOIS MEDICAL JOURNAL

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Editorial

LAY PHILANTHROPISTS SHOULD NOT BEGRUDGE TO THE MEN WHO MAKE HEALTH POSSIBLE, THE RIGHT TO EARN THE MEANS OF SUBSISTENCE

When the doctors of the United States pause to take a square eye-to-eye look at themselves and their profession, the majority are startled into both scientific and economic consternation.

Medicine is smitten with socialism. Whether medicine can survive unless there is a cessation of communism at its roots is a moot question. When it comes to communism, size up the clinics, free and pay.

Among manifestations of this increasing destruction are for example the so-called "pay" clinics, alleged to be designed for the medical care of those persons, too poor to pay regulation fees, and yet both by education and by income disinclined for charity. These pay clinics so-called, manage to meet overhead largely through the mistaken generosity of foundations and endowments, and sometimes by large individual bequests. Whatever the source of the financing, inevitably it is of lay origin and naturally of lay control, and this would be amusing were the situation less serious, and being maneuvered absolutely for the profit of the laity! Everybody gets paid but the doctor. Physicians donate their services. Janitors, doormen, clerks, labor both skilled and unskilled gets paid, even the allied scientific services of the nurses.

In other words, the physician is cut off from even the moderate payments he might receive from the fees paid by those who attend the "pay" clinic. It is of record that the majority of physicians, in addition to charity services invariably grade a bill to a patient who is unable to pay "top" fees. This is a tacit routine of the profession.

Between the years 1924 and 1934 the scope and the numbers of the completely free clinic,—and here too, the doctor is the man whose name is missing from the payroll—increased at a

menacing rate. There are four times as many free clinics now as there were in 1924. It is estimated too that doctors are now attending daily without fee something like a half million patients, or almost half—40% to be exact—of the entire daily sick list of a million and a quarter patients, that statisticians say must be paid for.

It would be interesting to note how long a boot and shoe business could survive if 40% of its sales were the pure waste of a dead give-away, or charity disbursement. A doctor invests more years of his life in his study and takes far more physical risk to prepare to practice medicine, than does the boot and shoe man, to sell or to manufacture shoes. Yet it is from "big boot and shoe men" and their confraternity that come the profits that finance lay foundations now so well on the way to control medicine.

Free hospitalization of veterans is stretched to such a point that here is another cul de sac preventing physicians from a rightful place in the economic sun.

Compensation clinic work and mass production contract insurance work are two more of fenders against the rights and the future of the medical profession and the maintenance of science.

Spread of charlatanism, annually receiving further and further recognition by state assemblies and legislatures, results in the profitable wage earnings of some 11,000 practitioners of Mary Baker Eddyism; over 3,00 naturopaths each year, and what is a crime against public health, puts some $42,000,000 annually into the purses of the osteopaths, and into those of the chiropractics something like $63,000,000.

In fact chiropractors and osteopaths have become a problem almost as dire as that of the "Witch doctors" in Ethiopia, fighting the victims of the conflict between the troops of Haile Selassie and Il Duce! These quacks are now powerful enough to have secured separate boards of licensure in some states and are on the way to make this condition national. Further while posing as "drugless healers" it would be enlightening to secure accurate information as to the frequency with which these quacks actually DO do surgery and prescribe drugs and give prescriptions in their own offices.

Still another offense is the building and subsidizing of new clinics and laboratories by health departments, or universities frequently tax supported in competition with private practice. Here is an instance where politically controlled state or municipal boards of health or even of education exceed their jurisdiction and betray the profession. Supported by the tax-payers, and doctors are not exempt from paying taxes even though politicians whose pay comes from taxpayers, are so favored, here is another fine instance of the tail attempting to wag the dog. After all the state board of health or any local board of health is only a functionary for the superior and master science of medicine; but a segment of the entire whole, and useful only as it performs its own vital tasks.

In many large cities it has become the practice to pay salaries to physicians employed by welfare departments. For a long time the nurses in those departments were paid and the physicians went begging. Under criticism and revolt this situation was remedied, such payments for the medical care of the indigent but whitewash the real situation. Among the more obvious criticisms to be made against it are that doctors are but human after all and there can not help but be favoritism towards private practice rather than the welfare and moderately salaried tasks. As a matter of fact any doctor prefers a fee basis rather than a salary and is more responsive. The fee basis is provocative of more pride in the work and more discrimination. Another tendency towards inferior service from such salaried men lies in the indisputable fact that the welfare physician on a salary is more than likely to be a man chosen for his political rather than his medical efficiency. Again the city pays for double service more often than not since when the patient needs extra attention or hospitalization he must be sent to some municipal or state charity hospital. The whole system is poor economics, either from the standpoint of politics or of medicine, or of plain everyday human nature.

The United States is estimated to have some 145,000 physicians and surgeons who donate annually to charity in services some $63,000,000, a larger contribution to society than that made by any other group and almost to a penny the same amount of money as that earned annually by those prize charlatans, the chiropractics!

What a mockery! Further when the "free patients" begin their gleanings if noses were counted, every person who has anything to do with a "free patient" gets paid for what is done except the physician, whose services the "free patient" set out ostensibly to seek, and who is being criticized all along the line by the providers of the payments to all the others as the cause of the high cost of caring for the sick.

As a matter of fact, endowments, foundations, free and part pay clinics have taken away from the doctor nearly 71% of what might be called commodity medical business. For this statement no less a medical man than the president of the Philadelphia County Medical society stands responsible, as well as for the statement that of the $150 spent annually by the average American family only $22 *goes to the doctor, the dispenser of medical care!* The remaining 85⅓% is dropped all the way along the line from the nurse to the pharmacist to the hospital. A doctor spends a dozen or more years in his preparation to practice medicine and a nurse anywhere from two to four years—usually three. The bulk of the money spent in a hospital does not go for medical or surgical attention or in fact professional service of any kind but for the patient's "board and keep", in other words shelter, heat, and food. Yet it is not that section of illness cost that is under bombardment, it is the doctor, without whose scientific knowledge the sick could not be cured, nor pain palliated, upon whom the entire system swings as upon a pivot and whose bill, if paid at all, is the last to be considered. Physicians have never been known to refuse care to a sick man simply because he couldn't pay, if no other medical care were available. The profession's charity is synonymous with its work, but the patient who can pay and won't pay, and the foundation that is going to distribute medical charity for the medical profession are both cut out of the same piece.

As a matter of fact, the foundations themselves and the groups and the endowments have got the cart before the horse. They should have endowed the medical and not the general public if they were really in earnest as to standardized medical and nursing care for the indigent ill.

Civilization hangs upon scientific medicine, which by its prophylactic practice saves the world from ills innumerable. Commerce hangs upon civilization, in turn, yet commerce and civilization are both showing appreciation by giving medicine a slap in the face. It would be most seemly if the medical profession were to distribute reprints of the old fable about killing the goose that laid the golden egg. It is surprising sometimes to find out what people do not know!

Medical economics will take care of itself when lay economists mind their own business and lay philanthropists keep their fingers off the medical profession. Let them make their hospitals, if they will, free for all! But begrudge not to the men who make health and wealth possible, the right to earn the means of subsistence.

GAS FILLING STATIONS AS FIRST AID HEADQUARTERS

The proposition to make every gas-filling station a first-aid station is something else again.

Pretty soon every hokey-pokey vendor will give out a pill to cure the baby's stomach-ache with every five cent ice-cream cone he sells.

And yet, in all fairness, it is no more right to begrudge the man who hands out "free air" and fills the gas tank and puts in "a little oil" his share of the exploitation of the doctor, than it is to let rich business men, retired merchants and inspired charlatans take command of the practice of medicine.

It is easy to see the line of argument. The body is a machine and the gas station attendants are sure to number at least one semi-mechanic. And so, if so, why not?

NO SCIENTIFIC PROFESSION HAS EVER BEEN SO ENCROACHED UPON BY AN IGNORANT OR MISGUIDED LAITY AS HAS THAT OF MEDICINE

What the editor of this Journal has been preaching for almost thirty years echoes on all sides.

"Get medicine to organize and fight organized politics and organized communism with organized medicine."

There is the slogan. For organized medicine in national, state, county and municipal or community societies there are divers tasks and functions, which are both scientific and economic.

The scientific programs of a medical society

rightly concern the patient. *But* the economic side of tasks allotted any medical society should concern the profession itself and should include an interest in all problems of any nature whatsoever which affects the membership of physicians. These problems may be legal, political, personal, medical or economic.

Naturally enough the handling of legislative problems, and these in the last ten years have been thicker than June blackberries, rests with the state society. *But* the state society should arrange for some sort of annual assembly and a forum where current and probable legislative problems can be discussed and plans laid for a campaign relative to such measures. In turn the national organization should lend every effort to take out of the hands of the laity and to return where it belongs, into medical hands all lawmaking, and all *law suggestion* dealing with public health and welfare, and the entire supervision and practice of medicine. To medicine, politics is poison, and medicine seems to be struggling to assimilate a large dose of politics.

Public relations men and women of propaganda bodies go about sowing the seeds of antagonism to organized medicine. Here is where fire should be fought with fire. Phrases instead of physics are sent out to cure the economic indigestion still remaining, though the war is almost twenty years past. Everybody who can read and write and talk, whether they can think or not, is out to tell medicine what is wrong with it. The main cry seems to be that the doctors wax fat and prosperous while the country starves. If the function of the medical society calls for nothing else it calls at least for an education of the general public to a knowledge of the facts in the case—which are that no scientific profession has ever been so encroached upon by an ignorant and misguided laity as has that of materia medica, nor any other been as philanthropic and self sacrificing.

DR. COLWELL'S DAILY LOG FOR PHYSICIANS

A daily service of genuine helpfulness to every physician and a sine qua non for a bird's eye view of a medical man's daily financial condition is presented in the "Daily Log" for physicians issued by Dr. John B. Colwell of Champaign, Ill., and published by the Colwell Publishing Company, Champaign, Illinois. Price $6.00.

This is the ninth edition of the "Daily Log." For a number of years this volume has been a first aid to every busy doctor and his pocket book. Since first put out it has been subjected to yearly revisions and annotations though the general principle remains the same. "The Log" is just what its name says it is. Here is a daily financial record that is a brief, accurate, easily kept practical accounting system with daily, monthly and yearly totals, and monthly summaries and balances of income and expenses. It is *not* a ledger. To make a complete accounting system, a ledger must be run with it as the ledger is necessary for gathering together separate items of an individual account. However, this "Daily Log" is about the best thing that a busy man can have. It is easily kept by any intelligent office assistant and shows the physician the progress of his business day by day, and at the close of the year sets forth the basic figures needed for the income tax return.

Though not a clinical record there is a "Service Rendered" column for brief annotations of clinical facts.

The only major change in this edition is a new cover design which gives the log a better appearance on the physician's desk.

1. Up-to-date revision of the Obstetrical Record, so that it will furnish the data needed for the birth certificate. All the Obstetrical record blanks are gathered in the back of the book instead of placing one sheet at the end of each month as heretofore.

2. An entirely new form of brief notations of Surgical Operations is found among the special pages at the end of each month.

3. The dating of the Daily Page is revised so that the day of the month always appears at the upper outer corner of the page.

Containing over four hundred pages, the ledger provides a separate page for the transactions of each day of the year with extra spaces for monthly and annual summaries, expense tables, special records, and incidental memoranda. The volume is not to be confused with the small or pocket-size dairies often furnished for physicians' records, since each page offers sufficient room for the recording of thirty-two patients per day, tabulating the service rendered and the financial account accompanying the transaction.

Where fewer patients are seen, the additional space may be readily utilized in recording prescriptions given or essentials of the physical examination. The system is built on a loose leaf plan and durably bound in fabricoid. This is the best and most compact financial record which has come to our attention.

CARE OF INJURED EMPLOYEES ON WORKS PROJECTS

Soon after November 1, 1935, The Works Progress Administration (W.P.A.) will begin various projects in every county in Illinois to give employment to thousands of men over a period of one year. With so many men doing various types of work it is quite obvious that there will be many injuries received in the line of duty.

All injured employees will receive adequate care from physicians as a responsibility of the United States Employees' Compensation Commission.

Rules and Regulations Number One issued by the Commission on July 15, 1935, governing compensation and medical treatment for Works Progress Administration employees, requires that all vouchers, Form S-69, for medical services and all services in connection therewith be endorsed by the local Compensation Representative. All physicians, hospitals, and all others submitting charges should be instructed to submit vouchers, Form S-69, to the local Compensation Representative who in turn shall see that the services were authorized, charges are itemized on Form S-69, and signatures are proper, before endorsing the voucher and transmitting it to the Commission. Written authorization, if not previously submitted, should accompany the voucher for services. (Special Bulletin W. P. No. 1.)

The State of Illinois is divided into seven districts, one of which comprises only the city of Chicago, another Cook County outside of Chicago and three adjoining counties, while the remainder of the state is divided into five other districts. In addition to the State Director, State Compensation Officer, and their own personnel, there is a District Director and Compensation officer in each of the seven districts, and there will be appointed a local compensation representative in each community where projects will be under way.

The Illinois State Medical Society is pleased to announce to the physicians of Illinois that arrangements have been made with the Works Progress Administration whereby the physicians of Illinois who desire to participate in the giving of emergency care to injured employees provided they will follow out the instructions given above. A list of the physicians in each county in Illinois has been submitted to the State W.P.A. Director in duplicate so that copies will be available both in his office and that of each District Director.

Fees to be allowed to physicians for their services will be based on the usual minimum charge for such services in the local community, and should be billed accordingly. Each county medical society has filed with the office of the Secretary of the State Medical Society, their fee bill, or where one is not available, the usual charges for the various emergency services. In those instances where fee schedules have not been filed, the Veterans Administration medical fee schedule will be used.

PRACTICAL CONSIDERATION OF VITAMINS. THEY ARE STORED IN THE SYSTEM IN VERY SMALL AMOUNTS

Dwight L. Wilbur, Medical Clinics of North America (Rochester Number) September, 1935, pages 463-476, says:

There is much confusion as to the requirements for each vitamin and their relation to resistance against infection. All known vitamins are probably similar in that man is dependent on outside sources for supply and the behavior of vitamins suggest catalytic activity and that they are required in very small quantities, thus differing from proteins, fats, and carbohydrates (lack of official units of measurements). Vitamin contents of food varies in different seasons and in different years.

Vitamins (except eggs) are stored up only in very small amounts, while the other foods are stored up and may take the place of other foods (fats, proteins, etc.). Clinically insufficient vitamin supply to patients is recognized in the deficiency diseases only or by administering specific vitamins.

Clinical and experimental evidence show the requirements for vitamins A, B, G, C and D at some time of life. There is an increased demand for vitamins in pregnancy, growth, infections, gastro-intestinal diseases or operations may prevent assimilation of vitamins from the food: thus pernicious anemia.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Illinois State Medical Society
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Kankakee, Illinois

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Address all letters and communications to the Chairman.

MEDICAL ECONOMICS COLUMN FOR NOVEMBER

No new problem of economic importance to the medical profession has made its appearance in the past month. Several of the old ones are still unsolved and worthy of the continued study of organized medicine. As yet there has been no definite date set for the ending of Federal Emergency Relief, although in almost every paper there is the opinion of some of the speakers of the administration referring to the same. This shows that in reality the administration is more than anxious to return the care of the indigent to the local governmental units. They had hoped to accomplish much by the setting up of Works Progress Administration, but at the time of the writing of this article little progress has been made in this regard. It is impossible to definitely find the cause of the delay, and one guess is as good as another. To a somewhat casual outside observer, it would seem that the entire problem is much larger and more unweildy than was originally thought by its planners, and too much internal dissension has arisen between those who desire to handle the work, not to mention the expected entrance of politics and political preferment with all of its well known failings. Connected with the transfer of those now receiving aid from the FERA to the WPA, a new problem will confront the medical profession. As long as a family is on the relief roles of FERA, they are entitled to medical care, along with the other necessities of life, but immediately upon transfer to the WPA, they must again assume full responsibility for all their living expenses. This must include medical care. From the figures given out at this time, it will be absolutely impossible for a man with a family to live on the wages he will receive and pay for rent, food and clothing, not to mention such things as medical care. And let us not forget that the indigent has been given to understand that medical care is one of the things to which he is entitled. How then will the medical man be paid for this service rendered to the family of the men transferred to WPA? Frankly it seems that no provision has been made for this necessity of life and the medical profession will be expected to assume this added burden. Now, as excellent in theory as individual responsibility is in developing character and as enthusiastic as the medical profession is for the continuation of individual business in America, it seems that once more the medical profession is left "holding the bag," to use an old but very appropriate saying. Local governmental units, such as County Board of Supervisors here in Illinois, have neither the funds nor the experience to assume this added responsibility even if they had the desire to branch out into new fields. Surely this calls for some action by the Doctors of the United States.

Another question that has arisen in connection with the WPA is the care of those injured on WPA works. At first it was intended to have a few physicians in each county care for these men, and the physicians on the list of the U. S. Employees Commission were selected. This seemed a little unfair and at a meeting held early this month in Chicago, the special Committee under the chairmanship of Dr. Neal met a representative of the compensation division of the WPA and a pleasant discussion of the subject was held. It was agreed upon by all that the fair and equitable way of handling the injured was for all medical men of the community in which the project was being carried to be eligible for this work. Accordingly all men whose names now appear on the lists of the FERA have been transferred to those of the WPA. The fees agreed upon are the regular minimum charged in that community for similar services. Special forms must be filled out

in all these cases and it was further agreed that some one non-medical employee on each project would be charged with the responsibility of getting the proper forms to the physician in each case. The physician must fill them in completely and promptly. When the case is completed and the bills rendered, they will be paid direct from Washington. This agreement seems most fair, and it is up to medical profession to do its part to make it successful, for this is a departure from the regular method and any failure on the part of the medical profession is bound to result to their disadvantage.

Apparently the Board of Supervisors in the various counties throughout the state are slowly assuming their new responsibility of caring for the indigent of the county. They are trying all kinds of plans, but in most cases are proceeding slowly to avoid mistakes and are anxious for the cooperation and counsel of the medical profession. A strong committee from the County Medical Society can wield great influence for the good of the County, the indigent and themselves, by offering their assistance to the Board at any time they are wanted. The best plan so far advanced is for all the physicians to be eligible for this work at a price agreed upon by both the County Medical Society and the Board of Supervisors. This will vary in the different counties, but once agreed upon should be rigidly adhered to. Your committee believes that the County Board will quickly see the disadvantages of having a County physician, once the medical profession takes the time to explain the same to them.

It is encouraging to hear that some of the Counties have held symposiums on current economic problems and it is to be hoped that many more will do the same in the near future. Some of the speakers, such as Dr. Camp and Dr. Packard are in great demand due to their outstanding ability as speakers as well as their knowledge on the subject. We hope with the cooperation of the Educational Committee and the Councilors to soon have speakers available to address lay groups in any part of the state. This is however a slow job, due to the difficulty of finding interested men, who are willing to give the necessary time to prepare their papers. Improperly or inadequately prepared papers are worse than useless.

Following this article is one by Dr. R. K. Packard of Chicago, past Chairman of the Council, on the subject "Ethics and Economics." It presents excellently some of the changes which have occurred in ethics in the past few years and draws conclusions, which should both stimulate our thoughts and please us.

E. S. HAMILTON,
Chairman of Committee on Medical Economics.

ETHICS AND ECONOMICS

Ethics and economics in medicine may have something in common, at least they are not inseparable. Ethics is a moral code applicable to all phases of our social organism and various codes of ethics have been established for the component parts of our society. Ethics is not new and philosophers for hundreds of years have written regarding standards of ethics. We are interested in our code of ethics which might be called a scientific effort to prescribe a moral and economic code for our guidance. Fortunately or not every physician establishes for himself some code of ethics, even though he be not familiar with our written code and if he be familiar in detail with the medical code he may make his own interpretations of it.

It is obvious that ethics cannot be standardized because men have not yet agreed upon a moral code. The fundaments of morals differ with one's philosophy and one's philosophy may or may not be influenced or controlled by his position in life and by his environment.

It has been said that if the medical profession had in the past or would in the future conform strictly to the code of ethics, that most if not all of our economic troubles would not have occurred or could be cured. We count among our evils contract practice, corporate practice, unethical advertising, unethical publicity, etc., and find at once that at least to most of us, they seem to be out of line with our code of ethics, and that therefore those physicians who have trespassed away from the fold and engaged in such practices have produced our ills. At least the great cry from both the profession and public as a whole is that on the one hand the physician is not earning sufficient and on the other hand the public are either paying too much for medical care or not receiving adequate medical care.

One must not reach a hasty conclusion regarding our ethics and the 100% observance of them, because it remains a possible point of argument, that we might have developed other equally or more troublesome complications by such strict adherence. Economic security brings independence to the front and it is not inconceivable that an economically secure profession might not have taken an attitude towards certain income groups needing medical service that would have been denied and therefore have brought forth a social plea for re-organization of our medical service. That the largest number of physicians would not have taken such action or stand, I think is admissible, but it is the minority often that starts the trouble which eventually may become the majority.

The other side of the problem is that many of these practices really started as a necessity, such as contract practice in railroad, lumber and mining camps, and they developed into evils by extension, so that what might be a moral code of ethics today might degenerate or develop in one that we would not consider a moral code in a few years hence.

One must discuss whether ethics changed our economics or whether economics changed our ethics. Recent changes in the economic status of many physicians undoubtedly led some of them to re-arrange their code of ethics, some of them to a wide open breach and some to the greatest distance without actually becoming compromised. When rent is due, when children need food, clothing, education, etc., and the income sufficeth not, it is not difficult to understand that man asks himself to decide between the code of ethics of his business or his profession and his code of ethics for his family because it at most a moral code and his judgment may be swayed by that which seems the closest to him. Again we hear it intimated that the code is flexible according to one's exact position. We have ethical and unethical publicity or advertising and what may seem highly ethical in one instance seems extremely unethical in another. Then ethical publicity may add to the income of one at the expense of another and one cannot determine the exact role in economics that proposed such publicity. Thus the physician may be very ethical as far as standing in the profession is concerned and highly unethical in his own mind. Ethics is to him a convenience and not a moral.

One cannot reach a conclusion in a discussion of ethics and economics in the medical field, nor in any other field, because moral responsibility is individual and flexible.

If economics have changed the ethics of the profession—I do feel that a majority of those who did become discouraged and dropped their membership and therefore to all intents and purposes discarded the code of ethics—have again come to feel that the code of ethics has done so much for them and the public that they hasten to return to the fold, because they can plainly see that without a code of ethics we become disintegrated and that whatever economic security we have at present would soon be swept away by unethical and chiseling practices. The more, men will return to the code of ethics and be guided by it as both a good moral and economic code, the better will the future of medicine be for the profession and the public, with the profession assuming a moral responsibility for the rendering of medical care to the American People.

R. K. Packard,
Councilor, 3rd District.

Correspondence

IS MINERAL OIL "HARMLESS"?

A Rejoinder

Chicago, Ill., October 15, 1935.

To the Editor:

Mr. Grant, in October Illinois Medical Journal intentionally or otherwise, has placed an entirely different construction on my use of the word substituted. I am not in the least concerned with the legality of a problem having to do with nutritional research. I am concerned merely with its experimental aspect. Whenever mineral oil is used in place of an indispensable fat, such use constitutes a substitution; and such substitution is indefensible. Mr. Grant has not furnished evidence which would convince anyone that such substitution of mineral oil for butter, or leaf lard or certain of the edible oils is other than nutritional retrogression. The facts are too evident.

Mr. Grant's presentation of the "clarification" of the whole question of mineral oil's vitamin de-

pleting property is rather incomplete. Also, when he states that only vitamin A may be diverted, he apparently overlooks the recent work having to do with the diversion of vitamin E; nor is it at all finally established that vitamin D is not diverted.

It is true that the profession "quite generally understands" the complete lack of food value attached to the use of mineral oil. The real issue is whether the medical profession is equally aware that the lack of food value is not nearly so serious as the nutritional impairment that comes from the disturbance of digestion. Pointing out that mineral oil is of itself valueless as a food is insufficient; it should be stressed that it interferes with the nutritional value of comestibles.

Perhaps a review of some facts collected from medical and biochemical literature may serve better to explain the perfectly legitimate premise that inasmuch as mineral oil is certainly not indispensable to the human body (there are many harmless substances that can replace it most effectively), and inasmuch as it does have numerous indictments against its use which suggest lurking danger and injury following its use; it is probably in the interest of all concerned to restrict its use to intelligent medical prescribing and to legislate against its promiscuous projection upon a greatly propagandized public.

As early as 1918 Bjerrum and Chrom reported upon poisoning with mineral oils, indicating that the internal use of liquid paraffin in experimental cats practically always induced diarrhea, loss of appetite and somnolency, and that one liquid paraffin was lethal in a dose of from 27 to 107 grams, or from about 1 to 3 ounces. Chrom protested against the use of mineral oils in any form in the preparation of food.[1]

Lanczos reached a similar conclusion in 1926, and reported the lethal effect of paraffin oil, the experimental cat dying on the fourth day after showing some somnolency and ptosis. He observed that the closure of the pylorus induced by morphine is almost without exception weakened or abolished by paraffin.[2]

Dutcher, Ely and Honeywell reported in 1927 that rat feeding experiments indicate clearly the solvent action of mineral oil for vitamin A, thereby depleting the ingested foods of this vitamin.[3] At about this same time Burrows and Farr, reviewing the work of Leitch, who has shown that mineral oils applied repeatedly to the skin of animals induced cancer and alleging that these same oils are responsible for cancers in man, ascribed the cancer producing action of mineral oil to the removal of fat soluble vitamins. Their experiments indicated that mineral oils, differing from vegetable oils, not only removed the fat soluble vitamins from the food, but produced other toxic effects as well. This was revealed by the rapidity with which Nujol brought on death, in about six to nine days, so that the harmful effect of vitamin depletion could hardly have established itself.[4]

The "diversion" of vitamin A from alimentary absorption by the presence of the non-absorbable liquid petrolatum was the subject of editorial comment in the Journal of the American Medical Association for 1927.[5] Olsen concludes that liquid petrolatum given by mouth did not interfere with digestion and absorption of protein and carbohydrate food.[6] It is hardly to be expected that either protein or carbohydrate, owing to its insolubility in liquid petrolatum, could be seriously affected by this solvent. Yet, in his principles of therapeutics, Osborne suggests that "coating the stomach and intestines with continued doses of oil can but inhibit the digestive juices, and also must inhibit the absorption of nutriment."[7]

Working in the Research Department of E. R. Squibb and Sons, Moness and Christiansen reached conclusions which differed from those of Dutcher and his collaborators, and stated that the liquid petrolatum (Squibb) which they used seemed to behave differently from the mineral oil used by Dutcher and his co-workers. This work has never been confirmed by other observers.[8]

Chunnon and Collinson produced evidence to show that liquid paraffin is absorbed to some extent, as is evidenced by the lowering of the iodine value of the non-sterol fraction of the unsaponifiable matter of the livers of rats which received liquid paraffin in their diet, and which was confirmed by an experiment on pigs in which the hydrocarbon was isolated from the liver.[9]

Jackson found that with rats, mineral oil causes a considerable loss of vitamin A to the animal organism if it be mixed with the vitamin A, in the form of butter, prior to digestion. If the administration of mineral oil is made sepa-

rately from the butter fat, only a slight diversion of vitamin A was observed.[10]

Rowntree's experiments suggest that the effect of mineral oil on the absorption of vitamin A appears to be dependent upon the amount of vitamin A in the diet, rats being unable to withstand the effects of the mineral oil given in doses comparable to human therapeutic use when the vitamin A level was only enough to produce subnormal growth.[11]

Twort and Twort observed the fatty infiltration of the liver of mice resulting from the ingestion of medicinal liquid paraffin.[12]

Mitchell, commenting upon the relation that exists between carotin and vitamin A, reported striking results such as to leave no doubt that mineral oil does seriously interfere with the assimilation of the pro-vitamin in plant cells. She concluded that the effect of mineral oil on vitamin A assimilation is of sufficient magnitude to be significant.[13] In another study, Jackson confirms the work of Dutcher, Ely and Honeywell in respect to the vitamin A depleting property of mineral oil. He concluded that it seems possible to overcome the effect of the mineral oil by the inclusion of extra vitamin A in the diet. He indicated also that the administration of mineral oil separately from restricted doses of yellow corn interferes considerably with the assimilation of the vitamin A factor in the corn.[14]

Dutcher, Harris and Hartzler, seven years after their first contribution, studied the assimilation of carotin and vitamin A in the presence of mineral oil, and confirmed their previous results. These investigators explained the harmful effect of mineral oil on the basis of carotin excretion from the body in the unabsorbed solvent. Their hypothesis is supported by the fact that yellow pigment excretion (when mineral oil is fed) is roughly proportional to the carotin ingested, which is not true when carotin is fed in the absence of mineral oil. They suggest that the lipids and sterols of the intestinal juices do not possess as great a solvent effect on the hydrocarbon carotin as does mineral oil, and that this preferential solvency is effective in preventing intestinal absorption of pro-vitamin A.[15]

Rapid and exceedingly devastating effects resulting from the feeding of mineral oil at a level of about 10% in the diet of experimental laboratory animals is quickly demonstrated. In fact, the impairment of health appears so promptly as to suggest that toxic effects beyond those of vitamin depletion can be difinitely ascribed to the ingestion of mineral oil. No experiment is so certain in its outcome and so easy to reproduce as that which points conclusively to the definite harm produced by feeding liberal amounts of mineral oil. Much work remains to be done in evaluating all of the various factors which contribute to that harm.

Mook and Wander reached the conclusion that it was dangerous to use liquid petrolatum as a vehicle for any remedy to be injected in subcutaneous tissue.[16]

Davis described the chronic granuloma produced by prolonged, continuous exposure of susceptible tissues to the irritation of paraffin. Disfigurement, deformity and interference with function, if the lesion is in a region requiring motility, are the chief types of disability which result; cancerous degeneration is an occasional intruder.[17]

Cooper and Freed challenged the advisability of using the oil intratrachially, indicating that liquid petrolatum, if injected into rabbits even in small amounts, is readily aspirated into the finest pulmonary divisons, where, being retained for a relatively long time, months, they can produce a proliferative bronchial pneumonia.[18]

Oil tumors, according to Burrows and Jorstad, that have remained small and quiescent for years in a patient have become active almost at once when the patient was placed on a salt and vitamin-poor diet.[19]

Twort and Fulton described the nature of the carcinogenic agents in mineral oil.[20] Twort and Twort have discussed the reaction of the skin to oils and tars and more recently have determined that the carcinogenic property of mineral oil is related to its refractivity constant.[21] The work of the Manchester Committee on cancer leaves no room for doubt in respect to the varying carcinogenic action of mineral oil. Twort reports that some mineral oils are much more carcinogenic than others, and all of them except white oils and spirits have to be viewed as potentially carcinogenic. Twort now arranges the chief world supplies of oil according to their cancer generating powers. The least harmful oils are Russian, and those from Pennsylvania and Texas come next, whereas the Scottish shales are highest, more than forty-five times as

potent as the Russian But oils of varying potency can be obtained from every single area, so that too much stress must not be laid on the origin.[22]

By no means are all the references given that bear on the nutritional harmfulness, the vitamin depletion, and the carcinogenic property of mineral oil. Only some of the work which has appeared in authentic British and American literature is referred to. And from this work any physician should safely conclude that mineral oil is far from being nutritionally inert or from being entirely free from the possibility even of producing cancer.

There seems to be little justification for defining the use of mineral oil and its related products in injections, a practice that appears to have been abandoned some time ago; or for the rubbing of mineral oil over the skin as is so commonly practiced in the case of most cosmetic preparations; or for treating the hair and scalp with mineral-oil and vaseline bearing hair tonics; or for the widespread inhalation of "nose drops" of mineral oil base; or for the promiscuous ingestion of mineral oil heralded so subtly by insidious free sampling propaganda through the innocent instrumentality of either a non-suspecting or an indifferent physician. However much mineral oil interests may argue their version of the harmlessness of that product there is no convincing evidence to the effect that a civilized public indispensably requires the extensive internal and external bathing as is everywhere urged by these interests.

From the published reports of good workers in nutrition and conscientious physicians it is easy to admit that mineral oil is far from indispensable. When human lives are at stake, it would seem good judgment either to replace this product with many others of known therapeutic efficacy from which the physician may choose. Unpublished reports are valuable only when corroborated. If there are instances where the inunction, the inhalation, the injection and the ingestion of mineral oil seem inevitably demanded for therapeutic purposes, the lurking potentiality of its nutritional harm, its vitamin depletion and its carcinogenic property should be sufficient to impel that kind of medical supervision that will result in the intelligent medical prescribing of mineral oil.

MILDRED ONCKEN, M. S.

BIBLIOGRAPHY

1. Bjerrum and Chrom: Poisoning with Mineral Oils, Ugesk. of Laeger **80**: 1023, 1918.
2. Lanczos, Anna: Effect of Paraffin Oil on the Intestine; Arch. Exptl. Path. Pharm. **112**: 365-78, 1926.
3. Dutcher, R. A., Ely, J. O. and Honeywell, H. E.: Vitamins Studies Xv., Dept. Ag. & Biol. Chem., Penn State College—Scientific Paper No. 430.
4. Burrows, M. T. and Farr, W. K.: The Action of Mineral Oil Per Os on the Organism: from Res. Lab. of Bernard Free Skin & Cancer Hosp. & Dept. of Surgery, Washington Univ. Sch. of Med., St. Louis, Mo. Proc. Soc. Exp. Biol. & Med. **24**: 719-23, 1927.
5. Editorial: Some Recent Observations on Fat Soluble Vitamins. J. A. M. A. **89**: 694, 1927.
6. Olsen, Alfred B.: J. A. M. A. **91**: 143-147, 1928.
7. Osborne, Oliver T.: The Principles of Therapeutics, Part III: 163, 1922.
8. Moness, E. & Christiansen, W. G.: J. Am. Pharm. Assn. **18**: 997, 1929.
9. Chunnon, H. J. & Collinson, G. A.: Biochem. J. **23**: 676, 1929.
10. Jackson, R. W.: Jour. Nutr. **4**: 171-84, 1931.
11. Rowntree, Jennie I.: J. Nutr. **3**: 345, 1931.
12. Twort, C. C. & Twort, J. M.: J. Hyg. **33**: 396, (Summ. p. 400), 1933.
13. Mitchell, Helen S.: Proc. Soc. Exp. Biol. & Med. **31**: 231, 1933.
14. Jackson, R. W.: J. Nutr. **7**: 607-616, 1934.
15. Dutcher, R. A., Harris, P. L., Hartzler, Eva R., Guerrant, N. B.: Jour. Nutr. **8**: 269, 1934.
16. Mook, W. H. and Wander, W. G.: J. A. M. A. **73**: 1340-1, 1919.
17. Davis, Benj. Franklin: J. A. M. A. **75**: 1709, (Summ. p. 1711), 1920.
18. Cooper, N. J. & Freed, Harold: J. A. M. A. **79**: 1739, 1922.
19. Burrows, Montrose T. & Jorstad, Louis H.: J. A. M. A. **88**: 1460, 1927.
20. Twort, C. C. & Fulton, J. D.: Jour. Path. & Bact. **32**: 149, 1929.
21. Twort, C. C. & Twort, J. C. (The Manchester Committee on Cancer): J. Hyg. **28-29**: 226-227, 1928-30.
22. J. A. M. A.: **103**: 1959, 1934.

THE LATEST IN FRACTURE DRESSING

Oak Park, Oct. 18, 1935.

To *The Editor*: The traditional method of strapping with adhesive plaster has the disadvantage that with many patients, especially fat ones, the plaster rolls over at the edges and in 24 to 48 hours is a rope around the chest instead of a flat band. It is uncomfortable and must be removed.

To prevent this it occurred to me that by using some thin, stiff, flexible material fastened to the outside of the band of plaster it could be kept smooth and flat. A dressing could be made to stay in place for a week or more or until the perspiration loosened it from the skin.

On investigating such stiff materials, I have found that sheet fibre (used as electrical insulation), .0015 inch thick, is ideal for the purpose. It will cut easily with the scissors, and will bend but not tear or crack. It is sold in sheets 50x80 inches.

The dressing is made as follows: A band of the sheet fibre 3 inches wide and 40 to 50 inches long is cut, a strip of adhesive plaster of the same size is torn from the roll. Lay this on a table sticky side up. Two strips of moleskin plaster about one inch wide are applied, sticky side down so that the moleskin covers about three-eighths of an inch of each edge of the broad band and projects over its edge. Now all three bands (stuck together) are turned over and laid on a piece of crinoline backing that comes with the 12 inch rolls. The strip of fibre is laid on the middle of them and the edges of the plaster are drawn over smoothly and stuck to the upper surface of the fibre.

This gives a stiff dressing with a sticky surface and edges not sticky covered by the soft moleskin.

While the patient exhales, wrap the dressing tightly around the chest over the fracture, and overlapping in front. With a narrow knife blade poke slits through the overlapping ends near the top and bottom edges, push a "Counting House" paper fastener through each slit and spread the ends of the fasteners inside. Stick a little piece of plaster over the inside ends of the fasteners to prevent scratching the skin. A second or third band may be applied overlapping if several ribs are broken.

This dressing will stay smooth without a wrinkle and not curl or cut at the edges and remain in place until it is taken off or loosened by excessive perspiration.

When the breasts are large, they are drawn up and supported by adhesive bands from the dressing to the shoulders.

It can be used beautifully as strapping for lumbago and in many other ailments where stiffness is required. It is giving great satisfaction in supporting the pelvis in separation of the symphysis.

LESLIE W. BEEBE.
Medical Arts Bldg.

EDWIN PLUMMER SLOAN, M.D.

(1876—1935)

JOHN R. NEAL, M. D.
SPRINGFIELD, ILLINOIS

The following excerpt from an editorial appearing the day following the death of Dr. Edwin Plummer Sloan justly summarizes the unique qualities of the man.

"In the death of Dr. Sloan, this community loses a fine citizen, a great humanitarian, a scientist whose fame in surgery, especially in the particular branch dealing with the treatment of goiter, is national and international. But in spite of the growth of his fame to world-wide proportions, Dr. Sloan was to his neighbors in Bloomington the same modest, kindly and unobtrusive man and friends which he had always been. He personally gave his time, effort and resources to improve local hospital facilities. He performed uncounted operations for which he did not receive pay, and thus performed services for the poor which equalled any the rich might buy. He was genial and hospitable. While the scientific world loses a great surgeon and humanitarian, we in Bloomington mourn the passing of a good friend and neighbor."

In spite of his too few years, Dr. Sloan lived a full, well-rounded life. Into less than sixty years he poured the tireless energy of a score of men. His record of accomplishment tells a remarkable story of a swiftly-moving well-directed usefulness. . . .

Edwin Plummer Sloan was born at Neosho, Missouri, February 13, 1876. He received his medical degree from the University Medical College of Kansas City, Mo., and in 1898 took up the practice of medicine in Illinois. In 1905 he located in Bloomington where he established the Sloan Clinic which for years has been a mecca to students and surgeons from all parts of the world. When the growing need for hospital facilities made it advisable, he took the lead in the establishment of the Mennonite Hospital in Bloomington where he served as chief surgeon until the time of his death. He has also been chief surgeon of the Staff of St. Joseph Hospital since 1908.

To a remarkable degree, Dr. Sloan possessed the scientific spirit. A painstaking passion for perfection characterizes all of his work. He spent the years of 1902 and 1903 in study in Berlin. On a subsequent study trip while visiting the Theodore Kocher Clinic in Berne, Switzerland he became impressed with the need for extensive research in goiter—then comparatively unexplored territory. From that time on he worked intensively in this field and through the rest of his surgical years was justly known as an authority in his chosen specialty. But in spite of this fact, Dr. Sloan never relinquished his skill and interest in abdominal surgery. His recent writings upon abdominal incisions and his skillful surgery testify to continued service in that field.

Under Dr. Sloan's leadership, in 1923, there was organized in Bloomington the American Association for the Study of Goiter. The following year saw its first three-day clinical meeting held in Bloomington with four hundred surgeons from the United States and European countries attending. He served this organization as president in 1924-25. Out of this Association was organized the International Conference on Goiter and in 1927 it held its first meeting in Berne, Switzerland with doctors from thirty-seven countries participating. He made two subsequent trips to Europe in the interest of this organization.

Although Dr. Sloan is most widely known for his scientific contributions to the field of surgery, his years of service in other fields are noteworthy. He will be remembered for his indefatigable efforts to further the scope and service of the medical profession. Since the beginning of his medical career he has been active in all organization work. In addition to his active membership in the leading surgical organizations both in America and in Europe, he assumed his full share of executive work in professional societies. He began as president of his County Medical Society. He was president of the Illinois State Medical Society in 1922-23 and for four years (1929-1933) he served Illinois as its delegate to the annual meetings of the American Medical Association. He has also been the McLean County delegate to the State Society for the last ten years. For eight years he served as president of the Advisory Board of the Illinois State Board of Health. In 1924 he was vice-president of the Tri-State Medical Society. Under Dr. E. H. Cary's regime he was appointed a member of the Judicial Council of the American Medical Association upon whose board he was at the time of his death. His absolute fairness and clear vision gave him an authoritative voice in medical council halls where his influence will be felt for many years to come.

As a teacher Dr. Sloan will be remembered by the many who came under his tutelage. For a number of years he has been a member of the faculty of the Chicago Medical School. Dr. Sloan was an instinctive teacher, marked by the generosity with which he shared the results of his research. All who visited his clinic were impressed by this fact.

In Dr. Sloan's death closes a magnificent life of honorable achievements. We mourn the passing of a greatness, a goodness we shall not know here again.

IN MEDICAL LITERATURE DR. SLOAN LEAVES THE FOLLOWING:

Effects of Goiter and Results of Removal on the Circulatory System. Read before the Southern Illinois Medical Assoc., Nov. 5, 1914.

Operative Treatment of Goiter. Read before the Tri-State Medical Society, Oct. 7, 1915.

Special Disorders of the Heart from Goiter. Reprinted from the Illinois Medical Journal, March, 1918.

Goiter Operation Technique. Reprinted from the Illinois Medical Journal, Feb., 1921.

Some Technical Points in the Operative Treatment of Goiter. Reprinted from Sept., 1924, issue of Illinois Medical Journal.

Medical X-Ray and Surgical Treatment of Goiter. Read before the Kansas State Medical Society, Topeka, Kan., May 5, 1925.

Prevention of Goiter. Read before the Illinois State Medical Society, May 19, 1925.

Tuberculosis and Goiter. Reprinted from the Journal of A. M. A., June 18, 1927.

Two Types of Toxemia in Toxic Adenoma. Read at the Post-Graduate Clinics of Michigan State Med. Society, 1928.

Froglore. Reprinted from the Welfare Magazine, October, 1928.

Etiology of Graves' Disease. Reprinted from The American Journal of Surgery, Aug., 1929.

The Role of the Thyroid in Differential Development. Reprinted from The American Journal of Obstetrics and Gynecology, Feb., 1930.

Abdominal Incisions. Reprinted from The American Journal of Obstetrics and Gynecology, Feb., 1932.

At the time of his death, he had ready a book on goiter which will be published in the near future.

NOTE: Dr. Neal, the author of this sketch, was chosen by a Committee to represent the Illinois State Medical Society in speaking at Dr. Sloan's funeral service.

IOWA AND ILLINOIS CENTRAL

The quarterly meeting of the Iowa and Illinois Central District Medical Association was held at the Le Claire Hotel, Moline, Illinois, October 18, 1935. Dr. H. B. Cushing, Professor of Children's Diseases at McGill University, Montreal, Canada, addressed the members on some of the "Newer Phases of Prophylactic Inoculation in Children—Pertussis, Measles, Diphtheria, Poliomyelitis, and Scarlet Fever.

The address was discussed by Dr. W. L. Crawford, Pediatrician of Rockford, Ill.

Dr. Cushing spoke before the Lynn County Medical Society at Cedar Rapids, Wednesday evening and before the Polk County Medical Society at Des Moines, Thursday evening.

Dr. Worling R. Young of Geneseo, Ill., presented a clinical case and Dr. Preston E. Gibson of Davenport gave a short talk on "In Children—Vomiting—The Symptom."

Over one hundred physicians of the Tri-Cities and surrounding territory attended the dinner and meeting.

James Dunn, M.D., Secretary.

EDUCATIONAL COMMITTEE
ILLINOIS STATE MEDICAL SOCIETY

September and October

RADIO PROGRAMS:

47—Health programs were given over stations WGN, WBBM, WAAF and WJJD. These talks were prepared and given by members of the Chicago Medical Society. The Committee has furnished copies of them to Bloomington and Decatur for local use.

Radio programs are at the present time given at the following hours and doctors are requested to tell their patients of these special health talks:

WGN—Tuesday afternoons at 2:30.

WJJD—Tuesday and Thursday mornings at 10:45.

WAAF—Tuesday and Friday afternoons at 3:00.

WBBM—Is used occasionally at 9:45 o'clock on Tuesday mornings.

Many of the smaller clubs and study groups are making use of the radio talks furnished by the Educational Committee.

SPEAKERS BUREAU:

42—Health programs were arranged for lay meetings in Chicago, Lake Forest, Libertyville, Effingham, Marshall, Chicago, Clinton, Wilmette, Oak Park, Louisville, Mt. Pulaski, West Chicago, Naperville, Glencoe, Belmont, Casey and Greenup.

A number of the programs were devoted to the discussion of Socialized Medicine.

Programs were scheduled for County Teachers' Institutes, Women's Clubs, Parent Teacher Associations, Schools, Churches, Mothers' Study Clubs, Kiwanis, Rotary and Lions Clubs, Advertising Club.

SCIENTIFIC SERVICE APPOINTMENTS:

28—Scientific programs were arranged for Aurora, DeWitt County, Elmhurst Hospital, Will-Grund County, Westlake Hospital of Melrose Park, LaSalle, Bureau, St. Clair, Sangamon, Rock Island and McHenry Counties and the Ninth and Tenth Councilor District.

An Obstetrical Clinic and program were arranged for LaSalle County Medical Society and a Pediatrics Clinic and program for the 9th and 10th Councilor Districts. A Heart Clinic is being scheduled for a southern Illinois County.

Similar clinical programs can be arranged for any county or district meeting in the State. These programs usually begin at 4:00 and carry through the evening. Physicians are requested to bring clinical material and the meetings are primarily postgraduate courses.

The new list of scientific speakers is off the press and has been mailed to secretaries.

PACKAGE LIBRARIES:

The American Medical Association has furnished the Educational Committee with a supply of material on socialization of medicine and medical economics. Forty package libraries on the subject of "Socialized Medicine" have been sent out in Illinois to debating teams and prospective speakers.

Special package libraries have been compiled for doctors scheduled to address lay meetings.

A number of libraries have also been loaned for Illinois doctors from the A. M. A. library.

SPECIAL CONTACTS WITH LAY ORGANIZATIONS:

The Committee has communicated with the public health chairmen of the Illinois Federation of Women's Clubs (has furnished health programs for four of their district meetings) and also the Child Hygiene Chairmen of the Illinois Congress of Parents and Teachers.

Publicity was given the Cancer programs sponsored by the Chicago Woman's Club.

Special radio broadcast has been arranged for the Adult Educational Council of Chicago.

Cooperated with National Hearing Week by giving all radio broadcasts during that week to the subject of deafness.

Contact made with the Health Chairman of the Illinois Business and Professional Women's Clubs.

SERVICE GIVEN TO COUNTY MEDICAL SOCIETIES:

25—Postal card invitations send for Randolph County.

588—Postal card notices about LaSalle County.

245—Notices about Bureau County.

150—Invitations to members of Jefferson-Hamilton County.

449—Postal card notices of the 9th and 10th Councilor District.

268—Invitations mimeographed for Henry County.

54—Letters sent to secretaries of county societies about health columns in their local newspapers.

175—Letters to physicians concerning subjects to appear on new scientific service list.

NEWSPAPER PUBLICITY FOR MEDICAL MEETINGS:

129—Releases DeWitt County Medical Society meeting with Dr. West.

111—Articles re LaSalle County medical meeting.

50—Articles re Bureau County medical meeting.

32—Articles re Jefferson-Hamilton medical meeting.

76—Articles re to newspapers announcing Pediatrics Clinic sponsored by the 9th and 10th Councilor Districts.

35—Releases of Henry County Medical Society meeting Service to Chicago Medical Society and Branches:

5—Releases to downtown papers about October 23rd meeting.

10—Article to newspapers re two meetings of Englewood Branch.

4—Articles to newspapers re Douglas Park Branch.

4—Articles to newspapers re Northwest Branch.

4—Articles to newspapers re North Shore Branch.
2—Articles to newspapers re Stockyards Branch.
5—Articles to newspapers re Calumet Branch.
6—Special articles to Branch Bulletins about Package Libraries.
6—Special articles to Branch Bulletins about High School Debates on Socialized Medicine.

PRESS SERVICE:

40—Health stories to papers using monthly service.
14—Health articles pertaining to child care to Blackhawk Park Nursery.
634—Health Columns to newspapers outside of Chicago.
78—Health columns to Chicago and suburban newspapers.
54—Health stories to papers using column sponsored by Douglas Park Branch of Chicago Medical Society.
1,130—Mimeographed radio talks on Child Health and Guidance to Illinois libraries.
260—Health columns to libraries.
16—Articles to Chicago Red Cross and Central Y. W. C. A.

Health articles were written and approved as follows:

Simple Fractures.
Heart Facts.
What Quarantine Means to You.
Learn to Use Your Family Doctor.
Influenza.

7—New newspapers were added to the list to receive regular health columns for publication over local county medical society authorization.

Respectfully submitted,
JEAN MCARTHUR, Secretary.

ACTIVITIES OF THE WOMAN'S AUXILIARY

Mrs. Robert E. Fitzgerald, Wauwatosa, Wisconsin, President of the Woman's Auxiliary to the American Medical Association, was the guest speaker at the first meeting of the Woman's Auxiliary to the Chicago Medical Society held the Sherman Hotel on October 2. Her talk stressed the need of the Woman's Auxiliary and the important work it could do.

Dr. Julius Hess, President of the Chicago Medical Society, spoke to us at the same meeting on some of the problems facing medicine today. In his talk he exposed the true facts on the oft repeated statement that so many doctors are on the relief rolls. The investigation of the Chicago Medical Society revealed that there are only six doctors on relief and none are members of organized medicine.

The first meeting of the Board of the Woman's Auxiliary to the Illinois State Medical Society was held at the Palmer House in Chicago on October 19. Mrs. W. D. Chapman, President, of Silvis, presided. This meeting was attended by seven Officers, nine Councilors and ten Committee Chairmen.

Dr. Charles B. Reed, President of the Illinois State Medical Society, read a wonderful paper on "The Social Security Act," in which he explained the provisions of the Act and all the socialistic viciousness contained in it.

Miss Jean McArthur, Secretary of the Educational Committee, gave an interesting talk on the policies and aims of this important Committee of Illinois State Medical Society.

The Board is arranging an active year for the Women's Auxiliary to the Illinois State Medical Society.

MRS. W. D. CHAPMAN,
President.
MRS. PLINY R. BLODGETT,
Press & Publicity Chairman.

TYPE

JAMES H. DEMPSTER, M. D.

During the middle ages when the crusaders undertook their pilgrimage to the Holy Land, they returned from the Orient with a knowledge of three things that have affected western civilization to a greater degree than any other influence brought to bear on it since their time, namely, gun powder, the mariner's compass and movable types. Movable type, the craft of printing, how much it has modified our lives will never be accurately estimated.

However, it is not the purpose of this paper to philosophize on the art of printing but to be more practical. A knowledge of type need not be very extensive so far as the medical writer is concerned, yet it will not be burdensome for him to know a little of the technical detail of printed matter which is of daily concern. Printers have names to designate the various sizes of type. There is a new, as well as an old, nomenclature, something after the fashion of new and old nomenclature in anatomy. We give a few of the old with the corresponding new system in brackets. Nonpareil (6 point), brevier (8 point), long primer (10 point), small pica (11 point). There are a number of other sizes smaller than nonpareil or 6 point, and larger than 11 point, but those given are usually used in medical publications. Display type in advertising is in a department by itself and will not be considered here. Most of the reading matter in The Detroit Medical News is set in 10 point type. Foot notes and bibliographies are usually set in 6 point, and quoted paragraphs in the body of an article are usually printed in 8 point.

DIRECTIONS TO PRINTER

A line drawn under a word or sentence in any of these sizes of type instructs the compositor to set them in italics. Two lines under a word indicates capitals. Three parallel strokes under a letter indicates a capital. However, italics or capitals, used solely for emphasis, do not improve the appearance of an article and it is better when emphasis is desired to secure it by clear statement. Capitals are reduced to lower case type simply by a short line or stroke made diagonally through the letter. The letters "tr" written in either margin of a galley, the name for a long column proof submitted to the author for his revision, means transpose words, or letters in a word, as the case may be.

All corrections of proofs should be made on the margin of the galley opposite the error. Since all composition is done by typesetting machines, the possible errors are reduced in number. For instance, we never see letters turned upside down.

* * *

This final installment will deal with subjects which have apparently little relation to one another.

The matter of libel is to the editor or publisher of a newspaper or journal what malpractice is to a physician. The difference between libel and slander may be loosely defined as follows: Libel is anything of a derogatory or defamatory nature that may appear in writing or in print against a person's character. Slander consists of false or derogatory statements passed around by word of mouth. In other words, libel is printed and slander is spoken. The law recognizes every one's right to protection of his reputation or his character against any defamatory or false statement that would tend to lower him in the estimation of his fellow man. Sometimes his right is more honored in the breach than in the observance. Both slander and libel are emotions involving contempt, hatred or ridicule. In a journal devoted to science, needless to say, emotional expressions are out of place.

The legal definition of the two words goes into greater detail, but the above is quite sufficient for practical purposes. Dean Inge once said, "Criticize opinions and institutions, but do not attack individuals." Observation of this admonition will save both editors and writers many sleepless nights.

* * *

The next thing I would draw attention to is the law of the copyright. Most writers of papers in making quotations credit the source. In quotations made from old books, this is usually sufficient. Many recent works, however, usually facing the title page, contain statements worded as follows: "All rights in this book are reserved, no part of the book may be reproduced in any manner whatsoever without written permission." A writer wishing to quote a paragraph or sentence should communicate with the publisher and obtain permission, which is usually freely granted. The copyright refers also to the protection of original illustrations. The law of copyright is meant to protect the actual literary composition of a writer rather than the thought, which could be expressed in different language. Copyright protection is given not to ideas but to literary forms. Reviewers, however, are permitted quotations within certain limits in the course of writing the reviews of books.

* * *

My third subject refers to case histories. There seems to be no uniform standard for their preparation. Case histories should be written with as much care and thought as the author would devote to the preparation of an original paper. They provide much of the raw material of collaborators who are interested in working up the literature for monographs and text-books. Case histories in order to fulfill their function, should be adequate and concise. All abbreviations which are not readily and universally understood should be avoided. Sentences should not be represented as incomplete phrases. Findings in the examination of patients, which do not bear upon the case should be omitted. For instance, in a case of cancer of the stomach or colon, or of gall bladder disease, it is not necessary to report the vision or the hearing normal. Case histories properly prepared can be real contributions to clinical medicine or surgery. A condensed or hurried style should be avoided; if the case is worth reporting, it is worth doing well.

It is apparent that these brief papers have not attempted to deal with the art of composition which is a matter of years of self training The purpose has been accomplished if some definite idea is imparted to the reader regarding the way the editor and publisher like to receive manuscripts intended for publication.—*Detroit Medical News.*

SAFER INSECTICIDES FOR VEGETABLES DEVELOPED BY AGRICULTURE DEPARTMENT

Wider use of *pyrethrum* and *derris* seems to be the answer to the grower's need for keeping his leafy vegetables free from residues of the more toxic insecticides, according to W. H. White, in charge of truck crop and garden insect investigation, U. S. Department of Agriculture. Chemists and entomologists of the department have long sought substances that could be depended on to protect growing crops against destructive insect pests and still leave nothing harmful to human beings on the product to be marketed. Although this difficult problem is not yet completely solved, the scientists working on it have found that minute quantities of two plant products—derris and pyrethrum—kill many insects feeding on truck crops and are less likely than most inorganic insecticides now in common use to leave harmful residues.

Derris powder is obtained by grinding the roots of a plant native to the British and Dutch East Indies. Pyrethrum is prepared from the ground flower buds of the common daisy of the Far East. Insecticides made from both these imported products are now on sale in most seed and drug stores in the United States. Plant specialists of the department are investigating the possibilities of growing insecticidal plants in this country.

In tests recently completed, Mr. White says, dusts made by diluting derris root with tobacco dust, talc, or clay were just as effective as arsenical compounds in controlling three common species of cabbage worms in widely separated parts of the country. Derris root powder in water also gave good control of the imported cabbage worm. The dusts, however, gave better results and cost no more than the sprays.

Derris sprays and dusts saved beans from the depredations of the Mexican bean beetle in Ohio and Virginia. Here the sprays seemed better than the dusts.

Pyrethrum dust, mixed with tobacco dust or hydrated lime, preferably the former, controls the celery leaf-tier, a major pest of celery in Florida and periodically troublesome in the North as well. The same

mixture can be recommended also for curbing the celery looper.

Either derris or pyrethrum should be used in combating leaf feeding insects on lettuce and spinach, according to Mr. White. Both protect fall grown squash against the melon worm and the pickle worm. Neither derris nor pyrethrum, however, gave satisfactory results against the tomato fruit worm.

Arsenicals, other than lead arsenate, Mr. White says, may still be used on any of the vegetables mentioned, if they are not applied after the appearance on the plant of the fruit or foliage destined for market and if it is definitely known that all spray residue will be removed by washing or stripping before the product is marketed.

Field sanitation, always an important supplement to spraying and dusting for insect control, is essential in the case of many leafy vegetables. Prompt destruction of all crop remnants removes a dangerous source of infestation of new plantings of cabbage, cauliflower, broccoli, kale, and collards. Destruction of crop remnants is just as vital as thorough and timely spraying or dusting in saving crops from destruction by the Mexican bean beetle. It is necessary also in fighting celery insect pests, especially the celery leaf-tier.

FROM THE APOCRYPHA

Book of Ecclesiasticus—Chapter 38, Verses 1-15.

HONOUR a physician with the honour due unto him for the uses which ye may have of him; for the Lord hath created him.

2. For of the most High cometh healing, and he shall receive honour of the King.

3. The skill of the physician shall lift up his head: and in the sight of great men he shall be in admiration.

4. The Lord hath created medicines out of the earth; and he that is wise will not abhor them.

5. Was not the water made sweet with wood, that the virture thereof might be known?

6. And he hath given men skill, that he might be honoured, in his marvellous works.

7. With such doth he heal (men) and taketh away their pains.

8. Of such doth the apothecary make a confection; and of his works there is no end; and from him is peace over all the earth.

9. My son, in thy sickness be not negligent; but pray unto the Lord; and he will make thee whole.

10. Leave off from sin, and order thine hands aright, and cleanse thy heart from all wickedness.

11. Give a sweet savour, and a memorial of fine flour; and make a fat offering, as not being.

12. Then give place to the physician, for the Lord hath created him: let him not go from thee, for thou hast need of him.

13. There is a time when in their hands there is good success.

14. For they shall also pray unto the Lord, that he would prosper that, which they give for ease and remedy to prolong life.

15. He that sinneth before his Maker, let him fall into the hands of the physician.

Miscellany

ULCERATIVE COLITIS: II. FACTOR OF DEFICIENCY STATES

Thomas T. Mackie, with the assistance of Miss Madeleine Henriques, New York (*Journal A. M. A.*, Jan. 19, 1935), observed evidence of deficiency states in 62.6 per cent of seventy-five cases of chronic ulcerative colitis. These indications find expression in the buccal and lingual mucosa, the skin, the type of anemia and the blood chemistry. When present in advanced degree they have invariably been associated with characteristic changes in the small intestine. Secondary, or conditioned deficiencies appear to be important factors in the pathologic physiology of the disease. Therefore deficiency disease is not to be regarded as an occasional complication of chronic ulcerative colitis. It seems more probable that it constitutes an essential part of the underlying mechanism. With the appearance of indications of deficiency disease the pathology changes; the symptoms become more complex, the clinical picture more severe, and the prognosis more grave. In many instances the evidence does not permit definite evaluation of the part played by single vitamins or specific food substances. The clinical phenomena suggest, however, that the deficiencies are multiple rather than single. Inadequate supply of vitamins A, B_1, B_2 and possibly D, together with lack of biologically complete protein, and of electrolytes, appears to contribute to the complex clinical picture in varying degree. The progress that many of the patients have shown under prolonged observation suggests that the potentially severe and untreated or imperfectly treated case tends to pass through three stages. In the initial phase clinical evidence of deficiency disease is lacking. The second stage is characterized by the appearance of early signs of deficiency. In the third stage, which is relatively rare, deficiency disease is severe and tends to dominate the clinical picture.

SHORT WAVE DIATHERMY: PRELIMINARY REPORT

Frank Hammond Krusen, Philadelphia (*Journal A. M. A.*, April 6, 1935), believes that before short wave and ultra-short wave diathermy machines are used extensively: 1. They should be improved in construction, and the manufacturers should specify definitely the wavelengths of the apparatus and their output in watts. 2. Fire hazards should be eliminated. 3. An accurate method of measuring dosage should be perfected. 4. More data concerning the physiologic effects of the waves they produce should be amassed. 5. The idea that the apparatus is simple to operate and that treatment may be given through the clothing should be dispelled. 6. The technic of application should be improved so that the danger of burning sensations is lessened. It would seem that with further study by physicists and engineers concerning the proper methods of constructing apparatus, and with further clinical investigation by especially skilled physicians in hospital physical therapy clinics, short wave diathermy may prove to be a useful therapeutic agent. But at the present time

many of these devices have not been sufficiently perfected, and it must be confessed that knowledge of the exact physiologic effects of these waves is very limited. Extensive employment of these machines at the present time can lead only to unsatisfactory results and may cause condemnation of a method of treatment that might otherwise be found serviceable.

CASE OF PATRICIA MAGUIRE

Eugene F. Traut, Oak Park, Ill. (Journal A. M. A., April 6, 1935), reports the case of Patricia Maguire, aged 26, who within a period of three weeks (previously healthy) developed stupor accompanied by fever, leukocytosis and bacteremia. The spinal fluid was clear but showed pleocytosis, increased globulin and an abnormal colloidal gold curve. The febrile stage and the deep stupor lasted three weeks. Various chemicals, vaccines, serums and hyperpyrexia were used. They are not known to have altered the course of the illness. Excepting occasionally scopolamine for sleep, she has had no medication since Feb. 28, 1934. She was given more than 1,000 feedings by nasal catheter without developing aspiration complications. The patient is very well nourished and has good color. Her muscles are large and strong. She has not spoken or made any purposeful movements except those of defense. She lies inattentive with shut eyes most of the time. The pupils do not react to light or in accommodation. The left great toe is constantly and rigidly hyperextended. She is fed by spoon or a catheter in the mouth.

THERE ARE THOUSANDS OF DOCTOR DAFOES ON EARTH

There are thousands of Dafoes on earth. One of them years ago wrote Robinson Crusoe and probably made money on the deal. One delivered quintuplets at Callander, Ontario. The other thousands will remain unheralded and unsung, and in many cases, unpaid. They are the rural practitioners who are daily accomplishing feats that the doctors of metropolitan centers would never attempt except on their "home grounds." No, they are not perfect, but they do the best they can and perhaps better than would we under similar conditions. They are not just "country doctors," they are marvels.—Medical Bulletin S. C. M. S.

THE STIMULATORY ACTION OF BILE SALTS ON THE LIVER

Nathaniel Goldstein of Brooklyn, N. Y., says: It has been known for some time that the bile salts exert a stimulatory action on the liver. Thus Sollman says, in his manual on pharmacology: "The only real, effective stimulant of bile formation is the administration of bile or bile salts." Cushny, in his textbook on pharmacology, affirms: "Bile is the only reliable cholagogue known." Further he states: "Most of the bile given by mouth is absorbed in the intestine and carried to the liver, which excretes it again, while a small quantity of the bile escapes in the urine. In the liver it increases the secretion of both the fluid and solids of the bile."

ENDOMETRITIS

Remember that the starting-point of inflammatory affections of the uterus is, usually, the endometrium, and may extend, eventually, to the muscular wall or to the peritoneum. Thus the uterine mucosa is the origin of nearly all of the inflammatory lesions of the pelvic organs.

Remember that all inflammations of the endometrium may be divided into the infectious and non-infectious.

Remember that septic endometritis is nearly always found following abortion and labor. It may follow insertion of instruments into the uterine cavity or operative procedures upon the cervix.

Remember that in acute endometritis there is a leukorrhea, sometimes profuse; or it may be thin and serous.

Remember that the history of a previous operation on the uterus or instrumental treatment should suggest endometritis.

Remember that sterility and abortion are very common in endometritis, caused by the changes produced in the mucosa by the disease.

Remember that the general physical condition of the patient varies. She may experience no ill feeling, or she may be hysterical, complain of dyspepsia, flatulence and loss of appetite.

Remember that the speculum reveals the origin of the leukorrhea and usually the cause of the endometritis, such as a torn cervix.

Remember that the gonorrheal variety of endometritis is due to the presence of the gonococci in the endometrium.

Remember that in the normal state the *cavum uteri* is absolutely free from pathogenic micro-organisms, hence infections must come from without. These may occur by the organisms ascending from the vagina, as is seen with the gonococci; or by manipulations at labor or at time of an abortion; or the most common method is by instruments introduced into the uterus.

Remember that the organisms most frequently found are the gonococci, the streptococci and the staphylococci. Infection by other organisms is not so common.

Remember that miscroscopic examination reveals the organism causing the endometritis and should always be made before any opinion is given by the physician as to whether it be a gonococcus or streptococcus infection.—George B. Norberg, M.D., in "Golden Rules of Gynecology."

THE CLIMACTERIC

The climacteric is not merely a syndrome of genital insufficiency, but the biologic consequence of a complex and constant endocrine crisis, the nucleus of which is the genital subsidence, but in the development of which all activities participate. All these general characteristics of the climacteric period are the reflections of a parallel state of functional irritability in the ovary, thyroid, suprarenals and other ductless glands, which are the fundamental glandular elements entering into this crisis.—Dr. Ethel M. Hite, in *N. E. M. A. Quarterly*, June, 1934.

Original Articles

THE SOCIAL SECURITY ACT AND THE DOCTORS

CHARLES B. REED, M. D.
CHICAGO

Two widely antagonistic forces are striving for dominance in America. On one side, is the desire and purpose of the individual to live his own life and carry his own responsibilities and secure the utmost mental and material development, while on the other is a conspiracy to have the people subjected wholly to herd ideas whether advantageous or otherwise—with only an inner certitude, a personal sense, necessarily imperfect, that the way the herd is directed is also the best way. The contest is between individuality and regimentation— and while regimentation with its attendant oppression has secured high place among the confused and decadent nations of Europe it will be fought bitterly in an America which has grown great through private initiative. Washington authority is doubtless aware of this but the immediate effect of this latest whimsy is to create an exhaustive military regimentation which will eliminate every act in science, art, industry and the family which is not supervised by a political appointee.

The doctor is by instinct and training an individualist and sometimes so zealous that he is reluctant even to join his fellows in a common aim but there is no field where such an attribute is more essential than in medicine. With proper professional equipment and wisdom the doctor should be free to exercise his best judgment in his gallant struggle against disease and death and to bring unhampered all his skill and experience to succeed in his daily combats with life's enemies.

Regimentation on the other hand deprives the average mind of all chance of growth and the aspiring mentality of all hope of fruition. Simultaneously it diminishes that superb efficiency which develops when a person responds to the normal incentives to happiness and success; incentives that arise from an inherent consciousness of a personal importance in the world of affairs.

Such individualism undoubtedly has often been carried to an extreme by zealous medical men. In their desire to conquer disease and help humanity they have become the slaves of charity. They give as always of their services gladly to the poor. Even before the war doctors of Illinois gave gratuitously medical and surgical treatments to the value of $18,000,000 a year and since that catastrophe the profession has been strained to the utmost in time, service and money. Yet the salaried altruists prate to the doctors about philanthropy—to the doctors, mind you, who almost invented this ministry.

The time honored attitude of the medical profession toward the indigent sick is well known, too well perhaps, and often imposed upon by such apostles of regimentation as the foundations, the salaried altruists, the social theorists and "charity brokers" who are anxious to enlarge the organizations they conduct and increase their personal prestige. Many institutions and at present many supervisors in the Emergency Relief service vie with one another to secure a numerical increase in their dependents for the enlargement of their personal perquisites and importance. The pose of Lady Bountiful is an expression of vanity and complacent superiority which has many satisfactions for those who can exercise it at the expense of others and be rewarded in addition not only in spirit and in money but in the golden aura of Government repute.

The principle is fallacious and unworthy. We should as reasonably expect the prisons and asylums of the State to compete for inmates. Such shameless avidity can only result in injury to the personal pride, self esteem and to mental deterioration of the victim. A worthy citizen is entitled to adequate aid until he is competent to carry on but as soon as possible the support should be withdrawn lest his morale be broken down, his motive power destroyed and a chronic dependency established.

The practice of charity is one of the most ancient and glorious traditions of medicine but the profession is aware that this phase of their calling is not infrequently misunderstood or abused by the undeserving, for that charity is pernicious which takes from independence its proper pride and from mendicity its proper

shame. The abuse of charity leads for the physician to pauperization of the body and for the patient to the even more serious pauperization of the soul. The abuse of charity moreover arouses the indignation of the doctor since every such case of malingering prevents the extension of legitimate aid to a worthy object. Loss of morale is an invariable consequence where high and hopeful qualities are regimented. The exercise of charity which has always been cherished as a laudable virtue has now become an organized and remunerative industry in the hands of social theorists who under the mask of humanity hoodwink the government, prey upon the doctors, exploit the poor and weaken or destroy the virile American traits of self respect, resourcefulness and resolution. The charity which is dispensed for a price is self interest rather than benevolence.

With a full knowledge of these conditions the medical profession has been striving to correct social evils, accommodate its work to the changing face of society; and adapt its practice to the gradual mechanization and industrialization of American life. New forms of medical procedure are being tested in nearly all the states and unusual plans for medical service are being introduced.

These experiments cover in some degree every respect of medical work and while some are conducted honestly and ethically others are devised exclusively for a private advantage. Schemes of medical and hospital insurance, free and pay clinics—medical care for a fixed yearly fee, contract practice and corporation practice are the most common examples.

Corporations, casualty companies and insurance societies are usually the outgrowth of lay efforts to exploit the medical man but in California and Washington, in Michigan, Massachusetts, Utah, Georgia, Virginia, Ohio and other states sincere efforts are being made to change the character of professional activity without a corresponding loss in that quality of competence and efficiency which stands highest in the world today. Some of these hundred or more projects under trial by county societies have been tentatively indorsed by medical authority and if allowed to develop will in time find a proper and satisfactory adjustment.

These methods of careful experimentation, however, are too slow for the social theorists and salaried altruists who want the world revamped according to their own vaporous fancies while they still are able to enjoy the expected prestige and the financial compensation.

They are possibly aware that the earth is some 150,000,000 years of age and alters slowly, but hope nevertheless to bring about a radical reversal of social conditions in a few intense unnatural months. The Utopians and the social theorists have always existed but the salaried altruists and the "charity broker" are purely modern productions. They belong to that large company of adventurers who prefer to exploit the assured rather than to explore the unknown. Thus they strive for regimentation of workers and employers, of proletarians and scientists and of physicians who are all four, by fiat. They visualize a large, clean, orderly housekeeping plant with themselves at the head and all other ambitions and means of development abolished, or subordinated to their personal theories regarding the method and direction which evolution should pursue and where remuneration could be most worthily and satisfactorily bestowed.

"It is one of the strange freaks of human nature, and one of the tragedies of government," says Senator Borah, "that many men who through political accident secure office, immediately become obsessed with the idea that they are the sole custodians of American principles, the sole guardians of American institutions and the exclusive possessors of American ideals."

The immediate goal which the salaried altruists hope to attain in medicine is socialization. This is a menace both to medicine and to the public. It is a most important factor however in their plan for the only social advance that ever obtained recognition was won by way of medicine. This is the first step therefore in a purpose openly or hesitantly admitted at Washington, to kill our democracy and substitute a collective form of Government which will reduce the entire productive portion of the population, as well as their guardians, to the level of serfs. This being accomplished the serfs can be put to work to support the lazy, the thriftless, the incompetent and the subnormal who are the particular pets and the most hopeful beneficiaries of the salaried altruists in their experiments. The most ominous feature of this

reactionary program is the effect upon the hapless victim who is arbitrarily deprived of pride, ambition and every incentive to serious effort. He is reduced to a soft, sloppy, gelatinous existence wherein only two primeval desires survive—to eat and to breed.

Mr. Laski thinks, apparently with the ardent sympathy of *Harper's Monthly,* that the medical profession is in decay because it is not communistic when in fact it is for this reason that it lives.

Communism is a beautiful theory but it is no more than that. It failed dismally to work even with Mr. Alcott and a few such high-minded enthusiasts as composed the Brook Farm Experiment. The fallacy in disinterested communistic thinking lies in the assumption that all human nature is unselfish and eager to work for the universal good. Human nature is not yet sufficiently angelic to do this as the Emergency Relief has conclusively demonstrated to every mature and unbiased mind.

If two people, a man and wife perchance, cannot adjust themselves to each other for more than a few years as the divorce courts reveal, it is too much to expect that the people of this country will calmly accept regimentation or that they will sacrifice themselves willingly for 25,000,000 aliens and strangers who will not do their share; who persistently refuse work and even sell their motor cars in order to get on Relief. The Social Theorists unconsciously or preversely overlook this impossible human element.

Mr. Laski refers with pride and confidence to the Russian experiment as if it had succeeded materialistically despite its extirpation of intellect. Yet Mr. Filene, a Russianized American, moved Heaven and earth to find an American doctor when he was taken ill in the very midst of his Russian icons. Senator Lewis too, betrayed the same distrust of a system which had expelled, or slaughtered its intelligentsia. Probably Mr. Laski and his communistic congeners would also abandon their woozy conceits in a similar realistic emergency—temporarily at least.

Such action would be very wise for human nature being what it is, the Russian doctor, or *any* doctor, under conditions of life wherein a premium is put on physique and irresponsibility and a penalty on intellect will revert to the barbarism which obtains in Russia with a complete annihilation of the professional ethic. Similar disasters also follow every attempt by a democratic government to control such public enterprises as railroads and air craft.

Social subversion was attempted once before, though very cautiously, by the passage of the Sheppard-Towner law which the states of Connecticut, Massachusetts and Illinois had sufficient pride, at that time, to reject—although they paid their tax.

Socialization of medicine is state medicine, and the latest attempt in this present upheaval is the passage of the Social Security Act. This act has a more plausible approach and a deeper rouge to hide its vaster viciousness, its more incisive teeth and its more dangerous political purpose than its predecessor. It is open, however, to the same objections and should receive the same thoughtful and united opposition.

The enabling act should not pass the Legislatures but since it is very probable that this bill will be forced upon the medical arm of the states through political pressure of one kind or another it is not unwise to study its provisions and discover the evils which medical men and our people must meet and suffer. The act calls for service to the blind, the aged and the unemployed as well as to maternal and child health, crippled children, child welfare, vocational rehabilitation and public health work. Such a bill presents an innocent philanthropic appearance and a most misleading title which suggests the banking and trust companies of 1929.

Obviously the medical profession has a direct and immediate interest in any scheme which is intended to transfer the ultimate control of intra-state sanitary and medical activities from the proper authority in the commonwealth to a Washington Bureau, and to a lay management either male or female—probably the latter.

Medicine, like individual liberty, is fundamentally an expression of the ethical life, and medicine suffers injury whenever and exactly to the degree in which its liberty is invaded. In the following discussion all reference to the ten principles[1] laid down by the Judicial Council of the American Medical Association for the protection of the public is omitted since they have been intentionally disregarded and taken from consideration by the proponents of the so-called "Security Act." This bill therefore must be discussed from other viewpoints.

To elaborate: This act is speciously advanced for the ostensible purpose among others of stimulating and aiding the states in promoting the health of mothers and infants. It denies that aid however to any state which will not submit its activities to federal bureaucratic control and match the federal bribe. Its solicitude therefore is either venal, or subversive. It is a direct and ill advised attack upon the public welfare.

In effect the Act empowers the Government to use money collected by taxation from all the states to induce or compel as many states as possible to cede to a bureau at Washington their inherent right to supervise and control the hygiene of maternity and infancy within their borders. The supremacy of the State Governments in matter of health is conceded practically by the federal authorities and while such a governmental interference is manifestly unconstitutional and generally admitted to be so by legal experts, yet in the challenge to the Sheppard-Towner Law, the Supreme Court refused jurisdiction. The present court may not be so gracious when the bill comes before it.

One reason advanced for the passage of such an act is that the maternal and infant mortality and morbidity of the United States is *excessive* as compared with that of other countries—countries wherein the statistics are very differently collected and analyzed.[2]

This charge never has been and cannot now be substantiated. Nor is it probable that the statistical figures quoted could be reduced, even if true, through legislative action by the federal government any better than by the states legally responsible therefor. In fact such interventions have failed to function satisfactorily in every country where government control has been forced upon the people. This is especially notable in Germany where medical progress has been absolutely arrested.

Experience with the Sheppard-Towner Law has demonstrated, as statistics show, that the mortality and morbidity rates are just as low or even lower in the states which did not stultify themselves by accepting federal aid as in those conforming states that ceded their constitutional birthrights for a mess of pottage.

The proponents of this act have produced no evidence that the health officers of the several states are less solicitous or more ignorant than the federal officers who will supervise them. There is no evidence that the people of any of these states, certainly not all of them, are so callous and indifferent as to require federal stimulation to supply medical care for their neighbors or that the state is too poor to allow of it. (Woodward.)

Furthermore, the Social Security Act has considerably broadened its scope as compared with the former bill. Besides giving artificial emphasis to maternal and infant hygiene it is so loosely worded that efforts to control practically all public health work are not only permissible but probable. This will include supervision of the milk, the water supply, food inspection, housing and sewer systems as well as venereal and other contagious diseases which may be and indeed are a vital part of maternal and infant welfare. Although not specified explicitly these are logically a proper function of maternal and infant welfare and will be so regarded. Apparently the public health officers of the state will of necessity become entirely superfluous.

The Security Act provides for arbitrarily allotted bonuses which are distributed equally to every betrayed and subjugated State without any reasonable relation to the hygienic needs but rather in accordance with the ratio of live births. In the Sheppard-Towner Law, the State of Oregon with an infant mortality of 53 per thousand did not require so large a bribe as South Carolina with its rate of 102; or Utah with its *maternal* mortality of 4.5 as much as Florida with a rate of 12.1 per M., but they received the same price for their unscrupulous betrayal of the State's legal prerogatives. Furthermore the present Act holds the complying State in perpetual pawn for the probationary dole can be withheld or withdrawn on the slightest pretext or the least sign of political disfavor.

Moreover, the success of the Security Act in increasing State aid is wholly problematical and open to various forms of evasion which cannot be controlled. For instance, a sum appropriated for prevention of contagious disease is not inherently a grant which would meet the federal requirements but since such an allotment is partly in the interest of women and children the State can at its convenience charge it wholly to that object as a bait for the federal bribe.

There are other reasons just as cogent for

invalidating a submission to this Act but they are as useless probably as the sheep's reasons against the greed of the hungry wolf, for the federal government has resolved to seize and centralize power as far as the Supreme Court will permit, even farther if possible. No Government can long exist without coveting the money of its citizens and as the ardor of acquisition increases agents of government soon begin to search hither and yon for money with the undignified eagerness of a dog biting fleas.

One of the principal objections of the Act is that it is wholly unnecessary. Statistics published by the League of Nations show clearly that the United States had a lower general death rate and a lower infant death rate in 1933 as well as a lower mortality and morbidity rate from diphtheria and tuberculosis than any first class power from which data were available. (And in Illinois less even than the average.) Since 1933 health improvement has been more rapid in America than in other large nations where public health is governmentally supervised. Moreover, any action by congress or other inconsiderate agency will lessen or destroy a medical efficiency of which the States may well be proud. If one has a good machine why turn it over to an incompetent, heedless, or self indulgent driver whose mischievous operation merely destroys the mechanism?

As the dissenting minority report in the Cost of Medical Care very properly declares, "There is nothing in experience to show that State Medicine is a workable scheme or that it would not contain evils of its own which would be worse than those it is supposed to alleviate. Above all there is no evidence to prove that it would accomplish what ought to be the first object of this Committee, a lessening of the cost of medical care."

The attempt to centralize in Washington the management of affairs that of right belong to the respective states is to create a system which inevitably destroys our democracy and betrays the fundamental principles of our government. If one constitutional right is abrogated by purchase or political pressure the others are not safe. In health matters this is particularly dangerous for in a very short time politics would have its finger on the wheel and inherent in politics are graft, stupidity, incompetence, intimidation and everywhere the suppression of individual enterprise and medical responsibility associated with a rapidly increasing tax rate. The inevitable rise in taxation must be emphasized for those who resent the present imposts since taxes in the immediate future will remind the Biblical student of that King of Israel who said, "Whereas my father did lade you with a heavy yoke, I will add to your yoke. My father chastised you with whips but I will chastise you with scorpions."

Regimentation of medical men under state control means unmistakably that the science of medicine is to be dragged in the gutter of political robbery at the behest of social theorists and sentimental perverts. The ritual of the weak spirit dominates the vision of the sentimentalist who like a sickly woman loves to finger—and to defile—the gorgeous livery of the Lord.

Sentimentality has never been successful in preventing politics from making a mess of public affairs nor has it hindered in any degree the besmirching and debauching of the school system. Is it probable that sentimentalists, social theorists, or salaried altruists will in any way obstruct contamination of medicine by political grafters even if their attention is arrested by it? "It will be a sad day for society," said President Wilson, "when the sentimentalists are encouraged to suggest all the measures that shall be taken for the benefit of the race."

Furthermore when federal and state governments undertake concurrent jurisdiction, the commonwealth practically surrenders its prerogatives and lets government dominate and perform those functions that are inherent and statutory to the State. Where Government has assisted Government eventually controls. Also when once a bureau is established it grows and expands and demands more and more support from taxation until government is driven to "whoopee' methods with the bread and circuses that undermined the morale of its citizenry and led to the fall of Rome.

Bureaucracy through liberal federal grants even now is sapping the vitality of the States and breaking down their moral and political independence. Bureaucracy is the slave of politics and results in a chaos of inefficiency. Under the so-called "Security Act" bureaucracy will destroy the initiative, the resourcefulness and

ambition of the medical man. Bureaucracy is always a curse, like a receivership in bankruptcy, and if once established in the practice of medicine it will emasculate efficiency and paralyze progress.

"The course we are now pursuing," says Senator Borah again, "will prove in the long run more dangerous than a foreign foe. A proud, strong nation may suffer a reverse in arms but time may still find it triumphant. An independent and self reliant people may be overcome by fortunes of war but time fights on their side to a final victory. But a nation whose citizenship has been drugged and debauched by subsidies and gratuities and bonuses—a nation which has surrendered to the excesses of a treasury orgy, has taken the road over which no nation has yet been able to effect a successful retreat."

In conclusion, we must endorse the opinion expressed in the ILLINOIS MEDICAL JOURNAL that "We have no sympathy with paternalism or unwarranted dependence on a grandmotherly State either in medical or commercial affairs. We are a staunch supporter of State rights, of local autonomy, of private initiative and neighborly cooperation. Bureaucratic administration is a menace to personal freedom and social progress" and we may add also that it spells ruin to medical efficiency.

State Medicine cannot change human nature though it may alter relationships. Independence in medical practice is as essential to the happiness and prosperity of doctors and to the advance of scientific medicine as independence in citizenship is to the welfare of government, and this priceless independence should under all circumstances be sacredly preserved to the people of "these United States."

30 North Michigan Avenue.

1. THE TEN POINTS SUGGESTED BY THE JUDICIARY COUNCIL OF THE AMERICAN MEDICAL ASSOCIATION

First: All features of medical service in any method of medical practice should be under the control of the medical profession. No other body or individual is legally or educationally equipped to exercise such control.

Second: No third party must be permitted to come between the patient and his physician in any medical relation. All responsibility for the character of medical service must be borne by the profession.

Third: Patients must have absolute freedom to choose a duly qualified doctor of medicine who will serve them from among all those qualified to practice and who are willing to give service.

Fourth: The method of giving service must retain a permanent, confidential relation between the patient and a "family physician." This relation must be the fundamental and dominating feature of any system.

Fifth: All medical phases of all institutions involved in the medical service should be under professional control, it being understood that hospital service and medical service should be considered separately. These institutions are but expansions of the equipment of the physician. He is the only one whom the laws of all nations recognize as competent to use them in the delivery of service. The medical profession alone can determine the adequacy and character of such institutions. Their value depends on their operation according to medical standards.

Sixth: However the cost of medical service may be distributed, the immediate cost should be borne by the patient if able to pay at the time the service is rendered.

Seventh: Medical service must have no connection with any cash benefits.

Eighth: Any form of medical service should include within its scope all qualified physicians of the locality covered by its operation who wish to give service under the conditions established.

Ninth: Systems for the relief of low income classes should be limited strictly to those below the "comfort level" standard of incomes.

Tenth: There should be no restrictions on treatment or prescribing not formulated and enforced by the organized medical profession.

MORTALITY AND MORBIDITY, 1933

	All Deaths per 1000 Pop.	Infant Deaths per 1000 Births	Diphtheria per 100,000 Pop. Deaths	Diphtheria per 100,000 Pop. Cases
United States	10.7	59	3.9	39
Germany	11.2	76	5.6	114
England and Wales	12.3	63	6.3	117
Scotland	...	81	7.2	180
France	15.8	75	..	50
Irish Free State	13.6	65	12.9*	113
Poland	14.2	128	17.0*	52
Illinois	10.5	49	1.7	22

*1932.

THE DIAGNOSIS OF MESENTERIC LYMPHADENITIS

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In the past few months, several articles have been published in medical journals indicating that increasing attention is being paid to the subject of mesenteric lymphadenitis. My own interest in this pathologic entity extends over the past eight or ten years, and includes 86 cases that have been diagnosed as such.

The early literature upon this subject was

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greatly influenced by the German writers who were of the opinion that these enlarged glands were tuberculous in origin. Until quite recently, most writers have stated that all, or nearly all, of these cases were tuberculous, and that any exceptions were uncommon. Further investigation of the pathology found in enlarged mesenteric lymph glands has given evidence that while a tuberculous lymphadenitis does exist, it is, in this country at least, of quite rare occurrence.

Struthers, Miller and Oehmigen believe that tuberculous infection is common while Speese, Heussen and others consider it to be rare. In 1922, Leonard Freeman gave a paper before the Western Surgical Association in which he considered this subject in connection with the diagnosis of acute appendicitis. His article marks the beginning of the present day attitude which regards this condition as one of the acute abdominal entities that has to be considered in making the diagnosis of acute appendicitis.

Acute mesenteric lymphadenitis is a condition which is being found with increasing frequency in patients with acute abdominal symptoms and it consists solely in an enlargement of the mesenteric lymph nodes. These nodes are more numerous in the right half of the abdomen than the left; they occupy a considerable amount of space in the mesentery, and they become larger and more numerous nearer the mesenteric root. The pathology found in the abdomen at operation varies according to the number, size and location of the glands. Sometimes they are enlarged throughout the length of the mesentery, while in some cases they are limited to the ileocecal region. As a rule, individual glands are seen scattered irregularly through the mesentery, but sometimes they are so numerous as to appear confluent. They vary from the size of a pea or smaller, up to the diameter of a 50 cent piece. Mead, in an excellent article published recently in the *Archives of Surgery*, has shown that the apparent size of a lymphatic node is fairly indicative of its weight. Fluctuation and suppuration were never present in my own series, and the glands were freely movable between the layers of the mesentery. Tissue about them is not irritated and lymph vessels are not enlarged nor palpable. There is no edema, infiltration nor fixation as in other inflammatory conditions. Microscopic examination shows only lymphoid hyperplasia, with no evidence of tuberculous or other infection. A few cultured glands gave negative results. In cases seen during the summer months and when diarrhea was also present, the peritoneum was injected and some free fluid was present, the ileum was mildly injected and in one case the terminal portion evidenced an acute ileitis. One patient who had acute symptoms two months after recovering from an attack of typhoid fever, had glands present and gross evidence of her recent disease.

Since none of these cases were found to be tuberculous and since no evidence of tuberculosis has appeared in those who could be followed up, speculation as to the possible cause, and the route of lymphatic gland involvement, presents some interesting possibilities. The association between acute tonsillitis and appendicitis has been reported by Brenneman and referred to by many others. Goldberg and Nathanson have cultured hemolytic streptococci in a small percentage of glands examined in their series of cases, and have found streptococci present in a high percentage of throat cultures. In my own series of cases, sources of infection seemed possible from either the respiratory system or the intestinal tract. Nearly all cases had some recent antecedent infection. In the winter and spring months this condition was found chiefly in children and a few young adults, who had infected tonsils, or a recent cold. About 90% of these had enlarged cervical glands present. Some had an acute bronchitis at the time of operation. In the summer months, the majority had been preceded by an attack of diarrhea, usually a week or ten days before the onset of acute symptoms. Since there has been a demonstrated preceding infection in over 90% of this series, it seems quite logical to assume that this "Mesenteric Syndrome" is due to a generalized lymphadenopathy following a streptococcus infection, or more probably to the absorption of toxins of these bacteria that have been swallowed.

Most of the patients have been children or adolescents, with a fair number of young adults. The youngest was four years of age and the oldest, 37, the average age being about 14. The total number seen was 86, of which 78 were verified by operation. Eight cases had the same clinical findings, but operation was not done, so

in this group there may be some question as to the accuracy of the diagnosis. Some of the children were pale, underweight and anemic, but there were more who were rugged and in otherwise good health. Over half had had repeated mild attacks of abdominal pain, prior to the one that brought them to the hospital, and they are particularly interesting in view of the ultimate results.

Pain is the one constant symptom. This usually comes on gradually with increasing severity, with colicky paroxysms. In the beginning it is often mild and as a rule is not as severe as in the average case of acute appendicitis, but there were many children who had paroxysms that were quite distressing and a few had pains that resembled a kidney colic in severity. One boy of 20 had an acute attack of pain at 10:00 A. M. and when seen at noon, the pain was of such intensity that a perforated ulcer was considered as one of the diagnostic possibilities.

Nausea and Vomiting are quite common, particularly in the older patients, nausea being noted in over 60% and vomiting in 25%.

Temperature usually ranges from 100° to 101°. The minimum was 99° and the maximum 103°.

Leucocytosis was usually present, averaging around 11,000 but in one case was 30,000. Many cases had a normal white blood count but it usually varied in proportion to the temperature present.

Rigidity is not always seen, although in an occasional instance the abdomen is very rigid. It usually appears as a slight spasticity of the right rectus, which varies in degree, being present at one examination and absent at another.

Abdominal Tenderness, in my experience is the chief method of differentiating between acute mesenteric lymphadenitis and appendicitis. In most cases of acute appendicitis, the tenderness is definitely localized to the right lower quadrant, and usually to McBurney's point. Rebound tenderness is quite constant, and the further away one presses from McBurney's point, the less the tenderness becomes. In acute mesenteric lymphadenitis, however, the tenderness is quite generalized. There may be a tender area over McBurney's point, but there is also another corresponding area on the left side. One side is often as tender as the other and a moderate amount of tenderness is present in the upper abdomen, also.

Urinalysis is essentially negative although when vomiting is pronounced, acetonuria may occur. The tonsils are usually infected and enlarged. A great number, over 90% in the winter and spring months, revealed streptococci in cultures and smears. Most of these also had numerous enlarged cervical glands. So much so, that we now consider mesenteric lymphadenitis as a possibility in all young people with addominal pain, who have enlarged cervical glands.

The course is brief, two or three days being sufficent to bring about improvement, whether or not operation is done.

A check up on the pre and postoperative diagnosis indicates that this condition is clinically indistinguishable from acute appendicitis in a great many cases. This, however, should not discourage us from an attempt by further study, to improve our diagnostic ability, and to learn more about this frequently overlooked condition. Of the 78 cases operated on, 32 were diagnosed preoperatively as acute appendicitis. A normal appendix was removed and the enlarged mesenteric glands demonstrated. One case was complicated by an acute cold, one by a sinus arrhythmia and one by an acute pyelitis, but all recovered. Thirty cases diagnosed correctly as acute mesenteric lymphadenitis, were operated on, the glands demonstrated and a normal appendix removed. In several of these, a single gland was removed for microscopic study. All recovered. Sixteen cases presented the unexpected combination of acute appendicitis and acute mesenteric lymphadenitis. In 10 of these the preoperative diagnosis was acute appendicitis but in the remaining six, it was acute mesenteric lymphadenitis. In these six cases a laparotomy was done because of our feeling that an appendectomy should be done in every case where lymphadenitis is diagnosed because of the high percentage of diagnostic error, but we fully expected to find nothing more than a lymphadenitis. Four of the 16 had peritonitis and one of these died of paralytic ileus. Several had suppurative appendicitis in which perforation had not yet occurred, and in these cases, the presence of adenitis may have been secondary to the appendiceal inflammation. The absence of adenitis in other cases of appendicitis, makes this sup-

position uncertain. There have been several other cases, not included in this series where mesenteric lymphadenitis was diagnosed or suspected preoperatively but which at the time of operation were shown to have no glands present and where the trouble was due to an acute appendicitis.

In addition to this series, we have seen eight cases with mild abdominal symptoms, general abdominal tenderness and cervical adenitis in the presence of acute respiratory infection.

Here acute mesenteric lymphadenitis was diagnosed and conservative treatment was recommended chiefly because of the extent of the respiratory trouble, making them poor risks for abdominal section. All these recovered in two to five days.

The outstanding points of interest have seemed to be the association of this condition with acute respiratory infections in the winter months, and with intestinal infection in the summer. Its occurrence in the presence of suppurative appendicitis, makes one consider the possibility that in these instances the glands may have been secondary to the appendicitis. The contrasting fact that in most cases of appendicitis there are no glands present, makes it appear that in this group they were probably an incidental affair, produced separately and in no way connected with the appendicitis.

The postoperative course in our experience has been quite satisfactory. One writer stated that his patients had postoperative recurrence of the symptoms, but this has been contrary to our own observations. Many of the children reported here had several attacks of abdominal pain previously. One young woman in particular had been compelled to quit work for three months because of the recurrent pain and associated ill health. Following the removal of a normal appendix and the removal of one mesenteric gland for diagnosis, she has recovered and returned to work, being free from symptoms for over two years. In all the cases that could be followed up, there has been a definite cessation of symptoms and a return to health, dating from the operation. It is quite obvious that the removal of a normal appendix could not account for this and it seems quite possible that the mere reaction of healing following an abdominal section, may have an effect similar to that which occurs after a laparotomy for tuberculous peritonitis, where recovery is not uncommon even though the infection is not removed. Whatever the cause may be, the patients have often dated their recovery from the operation.

Postoperative treatment has varied from routine x-ray therapy to the abdomen and tonsillectomy in the earlier cases, to ordinary postoperative care in the later ones. The end results have been equally good, although in theory, tonsillectomy appears to be indicated. A few cases have been found where mesenteric lymphadenitis occurred in patients who had had tonsillectomy done previously.

It has seemed possible after seeing several cases close together, to be able to diagnose this disease correctly in a fair percentage of the patients. However, when one considers the high percentage of diagnostic errors made and when one further considers the lethal possibilities of a mistaken diagnosis, when appendicitis has to be kept in mind, there seems to be only one possible conclusion. This is that when one sees a patient with the symptoms just enumerated, he should consider acute mesenteric lymphadenitis among the diagnostic possibilities, and should attempt to diagnose it correctly when possible. The treatment should, with very few exceptions, consist of an exploratory laparotomy and appendectomy on the basis that it is better to remove a few normal appendices in the presence of a condition that seems to be distinctly benefited by surgery than to jeopardize the patient's life by delaying in the presence of a possible appendicitis.

BIBLIOGRAPHY

1. Heusser, H.: Swelling of the Mesenteric Lymph Glands. Beitr. z. klein, Chir., **130**: 85-98, 1923.
2. Oehmigen, H.: On the Frequency of Calcified Mesenteric Lymphatic Glands in the X-ray Picture. Beitr. z. Klinik der Tuberkulose, Berlin, **77**: 361-373, 1931.
3. Pribram, B. O.: Mesenteric Lymphadenitis. Arch. f. klin., Chir., **140**: 589-600, 1926.
4. Cormipley, C.: Acute Non-Specific Adenitis of the Mesentery. Arch. d. mal. de l'app. Digest, **17**: 151-164, 1927.
5. Freeman, Leonard: Surgical Significance of Mesenteric Lymphadenitis. S. G. & O., **37**: 149, 1923.
6. Wilensky, Abraham O.: Mesenteric Lymphadenitis. Med. Record, **98**: 770, 1920.
7. Wilensky & Hahn: Mesenteric Lymphadenitis. Ann. Surg., **83**: 812-826, 1926.
8. Speese, John: Mesenteric Adenitis. Pennsylvania M. J., **32**: 225-228, 1929.
9. Struthers, J. W.: Mesenteric Lymphadenitis Simulating Appendicitis. Edinb. M. J., **27**: 22, 1921.
10. Miller, M. B.: Tuberculosis of the Mesenteric Lymph Glands. J. Kansas M. S., **32**: 1-4, 1931.
11. Etchegorry, P. A.: Suppurative Mesenteric Lymphadenitis. Semana Med., **1**: 990-993, 1927.

12. Schelly, F. A.: Calcified Glands in the Mesentery and Pseudo-Ileus. Nederlandsch tijds. v. Geneeskunde, 72: 734-735, 1928.

13. Bagg, Klara: Tuberculosis of the Mesenteric Lymph Glands. *Beitr. z. klin. Chir., 141: 23, 1927.*

14. McFadden, C. D. F.: Mesenteric Lymph Adenitis and Its Clinical Manifestations. Brit. M. J., 2: 1174-1177, 1927.

15. Brown, H. D.: Acute Mesenteric Adenitis Simulating Appendicitis. Surg. Clinic N. A., 9: 1195-1196, 1929.

16. *Brenneman, J.: Abdominal Pain of Throat Infections in Children and Appendicitis. J. A. M. A., 89: 2183-2186, 1927.*

17. Goldberg, S. L., and Nathanson, J. T.: Acute Mesenteric Lymphadenitis. Amer. J. Surg., 25: 35-40, 1934.

18. Mead, C. H.: Arch. of Surg., 30: 492-527, 1935.

19. Coleman, E. P., Western J. of Surg., Obs. and Gyn., 43: 193-198, 1935.

DISCUSSION

Dr. Julius H. Hess, Chicago: I have been interested in the question of abdominal pain in children for a good many years. I want to compliment Dr. Coleman on this excellent presentation. I do not believe that there is anything that causes the general practitioner as much distress as abdominal pain. As Dr. Coleman said, the greater part of his subjects were young children. The pediatrician's interest in this problem in this part of the country was awakened by a paper by Dr. Brennemann published in 1921. The subject of that paper was "Abdominal Pain in Sore Throat." Brennemann told us that surgeons about the country were operating on too many abdomens that did not need surgery, and he set out to set them right. We pediatricians decided that Brennemann was right. As we went along we saw some cases in which delayed operation resulted in serious complications. In 1927 Brennemann wrote a second paper on "Abdominal Pain and Sore Throat in Appendicitis." The second paper was written because he believed that the internists took his first paper too literally and he wished to correct the impression created.

I divide my own cases of abdominal pain largely into two groups. First, the so-called colic and abdominal pain we see in the older infant and rather young child, usually before the age of four or five years. We all know that the appendix has a great deal of adenoid tissue in the early years and that it decreases in amount as time goes on. Whether most of those abdominal pains and colics we see in the young are due to secondary involvement of the mesenteric glands and the adenoid tissue in the appendix or to some other factor it is pretty hard to say. I am sure that no one etiologic factor covers the group. We see very few cases of inflammatory appendicitis before the third year. If any of you have the opportunity to see an autopsy in a young infant, if you will look at the appendix you will see that that part of the appendix proximal to the bowel is not of the same caliber as that more distal, but is funnel shape and consequently empties much more easily. Dr. Jaffé in discussing appendicitis in children said he had seen very few obstructive cases with ulceration and gangrene in infants and children under three years of age. We undertook to look up our material and found eight cases under 3 years of age in which there was definite gangrene covering a period of about eight years in our hospital. These cases are not very frequent. Generalized peritonitis not secondary to appendicitis is far more common.

The second group, usually older children, who have repeated attacks of abdominal colic are commonly a neurotic type of individual with enlarged tonsils and adenoids. This is not the suppurative type of abdominal pain. Many of these children have allergic conditions and all no doubt from time to time have infectious processes.

The type that Dr. Coleman mentioned calls for a test of our diagnostic ability. The leucocyte count will run from normal up to 30,000, depending upon the individual response in different types of infection and the tissues involved. Those with low leucocyte counts may be the ones that have the worst intra-abdominal pathology. It takes a good deal of foresight to make a diagnosis. If there is one place where careful study of the history and findings is indicated, it is in these children. You all know the symptomatology made classical by Murphy in his description of appendicitis. The classification of abdominal pain, nausea and vomiting, localized abdominal pain and ridigity does not apply in these young children. Dr. Coleman has spoken of repeated attacks of abdominal colic in many of these patients preceding this rather acute thing he is describing. The past history in a child's life is of great importance. Having such a history before you, whether it is positive or negative, as far as abdominal things are concerned, it is up to us to sit at the bedside and study the child as far as the present attack is concerned. Most of them follow acute upper respiratory infection, others may be only allergic manifestations. A considerable number follow in the wake of intestinal infection. The intestinal group is far smaller in my experience than the upper respiratory. At the University of Wisconsin they studied a number of cases of appendicitis which they saw at different seasons of the year. They found appendicitis far more frequent during the months in which upper respiratory infections were more common. As Dr. Coleman has said, one thing that has been most helpful to him and it has to me has been the generalized abdominal pain without muscular rigidity. If you find localized pain, it is often in the region of the cecum. Here we have the largest number of mesenteric glands. In most cases you do not have generalized abdominal wall rigidity. In children, and most of these cases we are speaking of are in young children, rectal examination even in appendicitis is not particularly satisfactory.

About operation procedure, I am not as free to recommend operation as Dr. Coleman would lead you to believe he is. He has averaged 76 operations out of 86 cases. The reason I have grown more conservative is that I had had a number of abdomens opened and found them negative. I have seen more serious post operative reactions than Dr. Coleman describes in his cases. Many of my cases have had a high post operative temperature. Their faces are flushed, and their joints are sore and aching. Appendicitis does not act that way. I have had no deaths but I have seen some very disagreeable convalescences. After having been ultraconservative, then quite radical, I have again be-

come more conservative. I say this with forethought because I would hate to lead anyone into being too conservative, and then have a fatal result. Knowing that this condition is of short duration, that it does present a fairly clear-cut clinical picture, I feel that one is justified in sitting by for a limited period of time waiting for further evidence of localization, because you know you must get localization before you get general peritonitis in appendicitis.

The difference in Dr. Coleman's and my viewpoint is largely based upon the fact that he is thinking of this condition from the surgical standpoint while I see it as an internist.

Dr. T. A. Lawler, Taylorville: I do not like to go into an abdomen without at least a diagnosis of surgical abdomen, or like Dr. Coleman, I would rather go into the abdomen for adenitis when I thought there was appendicitis there than to let it alone. I am sure that I have done that a number of times. One or two cases at least in which I went in and found no appendicitis reacted better than I expected. I always try to find something else if I do not find a bad appendix, and sure enough I found a very bad nodule not far from the appendix. I removed it with the same result as Dr. Coleman mentioned, though it was quite serious. Just as I was getting ready to come here on Monday evening I was called to see a little patient. I found her with a 20,000 leukocyte count and sore abdomen, also bad tonsils, though no acute infection but bad adenoids. I thought seriously of going in. I left her in the hands of a good man and I know he will be careful. The mother was of the same type and had had several attacks. I operated on her six or eight years ago and her case was so much like the little boy's that when I was called she said, "Here is case No. 2." I rather wanted to take the child to the hospital, but he had a leukocyte count of 20,000 and I felt quite sure that it was an adenitis because I have seen similar cases. I have kept no statistics but there have been quite a few.

Dr. E. P. Coleman, Canton (closing): I believe if we can actually diagnose lymphadenitis there is no justification for operation. I have been watching for these cases, diagnosing it in 60 per cent. and missing it in 40 per cent.

Dr. Lawler asked about the nodule above the appendix present in his case. So many cases of appendicitis do not have mesenteric lymph glands present, it is hard for me to believe that it may be a causative factor. In eight cases where conservatism was recommended and followed, I have been rather criticized by some of my colleagues for neglecting an appendicitis. One patient in whom I thought it was a mesenteric lymphadenitis and recommended conservative treatment died of peritonitis. When I first started out in practice and found cases of appendicitis, very few patients came to the hospital early. You had to convince the family, the relatives and all the adjoining families that operation was necessary, and then by the time the patient got to the hospital peritonitis had developed. When one sees them pass out that way one begins to feel that true conservatism in appendicitis is early operation.

All these patients with simple adenitis recovered. At a medical meeting in Peoria I saw Dr. Collins open up an abdomen and demonstrate the lymph glands. He said he did not know what caused them but they recovered. I have seen some postoperative results, with no more reaction than many laparotomies have had.

I am never sure of my diagnosis in lymphadenitis. One Sunday afternoon I was called to see two patients with an acute abdominal condition, both under twenty. One I was quite sure was appendicitis because there was some rigidity, pain and tenderness localized over McBurney's point. I opened that patient and found a normal appendix, but a lymphadenitis. The second case was a typical mesenteric lymphadenitis. The patient recently had a cold and was not very sick. The leucocyte count was under 8,000. We opened up that patient and found a gangrenous appendix. So I do not believe from my own experience I am justified in delaying in many cases. I believe that delay or conservatism is justifiable where a young child has a little abdominal pain recurring and a recent cold, making the possibility of a postoperative pneumonia to be considered. Those cases should be left alone. There are some cases of appendicitis that should be left alone. If one can be absolutely sure of the diagnosis of lymphadenitis, no operation should be done.

HEALTH INSURANCE AND OTHER PLANS FOR SOLUTION OF MEDICAL ECONOMIC ILLS

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CHICAGO

Health insurance occupies an important role in medical, public and political discussions. The fact that it had its inception fifty years ago and has spread to forty-five countries has some significance. There is little uniformity in the plans adopted in the various countries, and changes are frequent.

Western civilization is accustomed to rapid changes in its political, social and economic problems and the new era of invention and industrialization and rapid economical transportation coupled with the transmission of power has added to the complexity of our problems and the rapidity of our changes. The Western World is composed to a large degree of industrial laborers dependent solely upon income derived from employment and necessarily a very large portion belong to the low income groups, and when employment ceases for a long period of time they become dependent on their relatives, the community or the state. Inasmuch as they also form the nucleus of our purchasing power, and

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their purchasing power stops with unemployment any marked increase in unemployment only adds to the unemployment role.

The other large group is composed of farmers and when there is unemployment in industry the market for farm produce drops and purchasing power decreases and depression results. The Western World has passed through such periods before and in each such period there has been an attempt to pass legislation tending to provide social and economic security. Every country passing through such a storm has attempted to legislate social and economic security. Mass rule under democratic forms of government, now nearly universal in the Western World, has made it necessary for the government in power to tie the people to the state or to the political party in power and those governments that have refused or neglected have passed from power and new forms and new parties have ascended. Such is the plight of the Western World today and particularly of the United States.

Health insurance, compulsory or elective with or without unemployment insurance, had its inception under Bismark to tie the laboring classes to the state and I may say as a general statement that a study of health insurance plans in every country will disclose facts that lead one to the assumpttion that they resulted from political expediency rather than as an answer to the problems of furnishing adequate medical care. to the low income group.

The proponents of health insurance in any form under governmental supervision base their arguments largely upon the statement that the laboring classes are not receiving adequate medical care and that they cannot afford adequate medical care because of the low wage they receive from industry and because of the uneven distribution of illness. Those who have made a study of incomes in large industrial centers even in periods of rather steady employment must agree that incomes are not sufficient to provide adequate medical care — especially in severe and prolonged home illness nor in cases that require surgery and hospitalization. Let us not forget, however, that in such instances that the local communities through endowed hospitals and county hospitals are prepared to care for such unusual occurrences, and that the doctors have always given their services free in such cases, so that those proponents who cite extreme cases must be reminded that we already have planned for such care. If in the ordinary run of events industry has not paid sufficient income to provide for medical care and other necessities of our modern civilization, then the problem is a challenge to industry. The argument that even though industry increased wages—the earners would not save a portion for sickness may be a valid argument and if so then industry could well look to a plan where they would establish that saving themselves, and assure a greater responsibility of leadership to their employees.

Adequate medical care can only be rendered at a cost and that cost must be met by the individual or some other method, and in the end industry as a whole has to pay the bill and as we are able to show the bill will be less if kept from governmental supervision.

Let us discuss Health insurance from the following standpoints:

1. *Does it provide a more adequate care?* The first essential to adequate medical care is that physicians must be trained and have time for study. Under health insurance the physician is compelled to see many more patients than he can properly question and examine, and is forced for lack of time to prescribe without complete examinations. No doctor can examine one hundred patients in an afternoon and give adequate medical care. You may pause to ask why does a doctor have to see so many patients and the answer is that the expense of clerical help to file and record the necessary forms are so high that there is little left for the doctor. The personnel outnumbers by far the doctors who actually render the service.

2. *Has sickness decreased?* The record shows that sickness has not decreased, and also shows that where health insurance is accompanied by sickness unemployment insurance that sickness increases because of malingerers.

MORTALITY AND MORBIDITY 1933

	Deaths per 1000	Infant deaths per 1000 births	Diphtheria per 10,000 population	
			Deaths	Cases
United States	10.7	59	3.9	39
Germany	11.2	76	5.6	114
England and Wales	12.3	63	6.3	117
Scotland	...	81	7.2	180
France	15.8	75	12.9*	50
Irish Free State	13.6	65	17.0*	113
Poland	14.2	128	...	52

*1932.

3. *Does Health Insurance retard medical progress?* Medical progress in the United States in the last fifty years has far outdistanced that of any other country and this has been accomplished through the efforts of the American Medical Association, The American College of Surgeons, and The American Hospital Association. The responsibility of improving medical education, improving hospital standards, increasing opportunities for post-graduate work has been assured by the profession and no country has made such rapid strides as the United States. Such advancement must add to the problems of adequate medical care and as a result the people of the United States today as a whole receive better medical care than any other country in the world. Adequate medical care cannot be legislated; it must come from an interested, honest, intelligent and ethical profession, assisted and cooperated with by the public and by the public and industry in particular.

4. *Has the cost increased or decreased?* The cost of medical care has increased in every country where it is practiced, as is evidenced by the fact that the cost for taking care of thirty-five million people in Germany is approximately three times as much as caring for the forty million not under health insurance and this in spite of the fact that 40,000,000 belong to the higher income group where fees would ordinarily be larger.

5. *Has the income of the doctor increased?* We have followed Great Britain in much of our social legislation. The general practitioner in Great Britain was in a sad plight before sickness insurance was established and he still remains in a sad plight. Contract and club practice was in keen competition before the enactment and price cutting had reduced the general practitioner nearly to starvation. Sickness insurance was offered as a solution to this evil, but it has neither corrected the evil, nor added little to the income. The average income in Great Britain of a panel physician is $2,000.00 per year and $1,000.00 of this must be spent in maintaining this practice. If this constitutes an improvement over the old system, it only accentuates the gravity of conditions before the enactment. No such conditions ever existed in the United States. Even the proponents of sickness insurance in Great Britain do not maintain that it has solved the problems of adequate medical care or improved the status of the doctor.

6. *Does the free choice of physician tend to provide a more or less adequate medical care?* It would seem but common intelligence, that patients seeking your services because of choice would stimulate a greater interest and responsibility than those who are directed to you without choice. Perhaps this should not be so, but humanity cannot be reduced to a machine and the pride of individualism will not be denied. Aside from this, one may properly ask whether or not the low income laboring group should be denied the right and privilege of choice and confidence and personal relationship.

We will now proceed to a discussion of other plans designated to improve the rendering of medical care to the low income group.

1. *Group Hospitalization*: For some years the writer has advocated group hospitalization as a means of improving not only medical care, but also as a plan whereby the doctor's income would be increased. The necessity for hospital care has increased with the progress of medicine and hospital costs form a major portion of the expense in large number of cases as illustrated by reports of Wayne County Medical Society that three out of five were hospital cases. In the low income group this puts a burden on the patient, the hospital and the doctor. Group hospitalization removes that burden on the part of the patient and the hospital and allows the doctor some chance of collecting his bill.

Group hospitalization is growing quite rapidly and while not solving all of the problems, it does seem to offer a means of distributing the uneven costs of medical care.

Membership in twelve of the leading group hospitalization plans totals memberships 64,044 and dependents 29,693.

The usual guarantee for hospital service is 21 days and this takes care of 95% of the hospital cases. The average stay in the hospital is about 8.5 days. Experience has taught that there is some difference in the risks taken, the most noteworthy one being that individual subscribers are bad risks and that when only a small proportion of eligible employees enroll the risk mounts because those most likely to need hospitalization are most likely to enroll. Women receive more hospitalization than men, due to maternity care and gynecological cases.

Women dependents entitled to but ⅓ or ¼ discounts require much less service than employed women. Non-dependents having full coverage have received such proportionately large amounts of care as to vitiate the principle of insurance.

Dependents in Group Hospitalization: There are various plans for the care of dependents, some on full coverage and some on discount plan. The cost for full coverage for dependents should be higher because experience has shown that they are more apt to enter the hospital for elective operations.

Group hospitalization plans should be safeguarded by the following:

1. A non-profit organization.
2. Free choice of hospital.
3. Free choice of physician.
4. Board should be composed of medical men, hospital trustees, and the subscribers should be represented.
5. Medical service must not be included.
6. Funds should be invested under some safeguard as insurance or trust companies.

2. *Sickness Bills by installment:* The Wayne County Medical Society has such a plan, which is an experiment in installment payment of medical bills. The client presents his case to the director of the Medical Service Bureau and furnishes the information required regarding income, rent, number of children, insurance, present debts, etc., and a plan is worked out and the employer is consulted and necessary arrangements completed with physician, hospital, etc. All bills are sent to the Bureau and 10% carrying charges goes to the Bureau. Up to January 1, 1935, 1,510 cases had arranged for service, and 719 required hospitalization. During this period $126,570.00 in bills were submitted and $34,125.55 had been collected. In view of the fact that a large percentage require hospitalization the plan does not give much income to the doctors for the hospitals ask that one-half of the hospital bill be paid first. The hospitals are not enthusiastic about the plan for they have no guarantee. Some hospitals demand a down payment of $25.00 or $30.00 before admission and some refuse to take the cases.

The plan, however, is an experiment and the value can only be determined by further experiment. Employment in the motor industry is very spotty and annual earnings average around $800 or $900 per year now. The family life is unstable and moving occurs at frequent intervals.

3. *Other plans:*

Alameda County (California) Plan: Before any plan was adopted, the Alameda County Medical Association undertook a study to determine the best method of providing medical care for the three classes: 1, the indigent; 2, the individual of moderate means, and 3, those who can properly finance their medical care.

Arrangements were made in October, 1932, for a co-operative plan by the medical association and the County Institutions Commission. Members of the medical association agreed to treat nonindigent patients privately for whatever fee they were able to pay, providing their ability to pay could be determined by the County Medical Society Service, and providing any necessary social work could be rendered by medical social workers of the clinics.

Table 1—Distribution of Referrals, for Medical Services Under the Alameda County Plan, made to Physicians in the County in 1933

	No.	Per cent	No.	Per cent
Total referrals			2,077	100.3
To county medical Association			1,898	91.3
To county medical Association	1,898	100		
For part-pay care	1,812	95		
For full-pay care	56	5		
To physicians not on list			158	6.5
To physicians—names not given			51	2.2

The social service department of the County Institutions Commission is responsible for contributing the following types of assistance to physicians participating in the plan:

(a) Social study.
(b) Medical social case work.
(c) Determination of the patient's ability to pay for medical care.

The physician makes at least one visit and renders the necessary service regardless of the patient's ability to pay any part of his fee. He then fills out a form giving certain social information and sends this to the social service department which notifies the local clinic if a social investigator is requested by the physician.

During 1933, 2,077 referrals to private physicians were made by social workers, clerks, nurses, doctors and others in the Alameda County agencies. These referrals were made to the three groups of physicians listed in table 1: (a) those who were members of the Alameda County Medical Association and had agreed to take patients

at reduced fees, (b) those who were not members of the Alameda County Medical Association and whose names, therefore, were not on the list and (c) referrals made to the secretary of the Alameda County Medical Association with the understanding that the patients could pay a full fee.

The Alameda plan has been much advertised throughout the country; however, a recent interview with a writer who had just visited California and had experience with this plan revealed that it has not added materially to the income of the doctors, and that its chief function had probably been to give employment to the social workers who are necessary in carrying out the plan.

2. San Diego Central Clinic Service: The Central Clinic Service of San Diego originated with a suggestion of the Health Council of the Community Welfare Council. The objective was to provide an organized method of meeting the medical needs of the resident indigent and others whose incomes would permit either a part or full pay service. The Central Clinic Committee is composed of representatives of the county medical society, the Community Welfare Council, the county and city health departments, the advisory board of the county hospital, the health and development department of the city schools, Navy relief and Mercy and San Diego hospitals. An executive secretary and staff operates under the supervision of the board of directors. The principal functions of this executive staff are to conduct a social service investigation to determine resources and fees to be charged and to direct patients to the physician of their choice or, if no choice exists, to a list of physicians in alphabetical order.

Table 2—Number of Patients Referred to Clinic, 1933

Referred by physicians	541	40.7%
Referred by self	218	15.4%
Referred by county	247	18.0%
Referred by Mercy Hospital	87	6.3%
Referred by Dan Diego Hospital	20	1.3%
Referred by school clinic	103	7.6%
Referred by other agencies	133	9.8%

Patients come to the Central Clinic Service from four main sources, the physician, hospital or clinic, or by direct application of the patient himself. By far the most important source is the physician, as is shown in table 2.

One of the important factors in the work of the Central Clinic Service has been to analyze expenditures with heads of families, to make suggestions and to plan monthly allotments, for medical service. It has been gratifying to find that this service is successful and that families have profited by the experience.

"Steering" patients is one of the real jobs of the Central Clinic Service. The 20% of patients sent to physicians at full fee were not all bargain hunters who came to the agency seeking lowered fees. Many of them were persons, who were at a loss how to arrange for adequate care. The explanations of the parts played by diagnostic and treatment service of the laboratories, *x*-ray departments, specialities of all kinds has been important. Interpretation of the social situation of the patient to the physician undertaking the treatment has been equally important. The plan has received favorable editorial comment in the *San Diego Union,* August 20, 1934.

There have been many private organizations engaged in some form of enterprise to render medical service. Obviously they should be discouraged because they are organized for profit by promotors with little thought of rendering adequate medical care to the individual. The unevenness of unemployment will always remain a problem and whatever the plan adopted may happen to be it loses its effect when unemployment develops, and that is the time of its greatest need.

The care of the indigent therefore remains a very serious problem and accounting Medical Societies must assume their share of responsibility in working out a plan with the Governmental Agencies for such care.

There should be a very strenuous effort made to abolish the old plan of the township or county physician, and have this work taken up by the County Medical Society. By the continued study of plans directly under the control of organized medicine, a solution to many of our problems will be found.

826 East 61st Street.

DISCUSSION

Edwin S. Hamilton (Kankakee): Members of the Conference: I certainly think you must be very much interested in this subject, due to the attention which you have given it this morning. That you are interested is very encouraging to the members of the Com-

mittee on Medical Economics, of which you know I happen to be chairman. I have listened to the men who have presented papers this morning. Most of them are specialists and I think were assigned a subject and talked on anything on which they wanted to talk. I did not see Dr. Packard's paper until about two hours ago and I am not going to try to discuss all of it. He brings up the subject of health insurance. In my opinion, health insurance, up to date, has really offered the public nothing. The only thing in which the public is really interested is security. Certainly from what we have been able to read in regard to foreign countries which have adopted this plan they have no more security, in connection with medical care, than we have in this country. The ones to whom it has been offering security are the politicians and social service workers. If you will view it in this country and in Europe, the politicians and social workers are the ones who are advocating it most of the time.

As a result, the center of medical education has moved from Germany and Austria to the United States. That, in itself, is an answer as to what effect health insurance has in the practice of medicine. Those of you who have read the most excellent article of Gustave Hartz, probably the most outstanding economist of Germany, cannot help but be struck by the fact that he states many of the present economic ills of Germany, not alone medical, but the economic ills of Germany, can be traced directly to the results of socialization plans, and particularly those socialization plans in regard to medicine. He even goes so far as to make the statement that if Germany stayed away from socialization, particularly that of medicine, it would not be in the bad condition in which it finds itself today. Mr. Hartz is not an M. D. He has studied the subject of economics from all angles. For those who have not read the article, I think you would receive it by writing to the Secretary of the State Society at Pittsburgh. It would be worth your time to read it.

The subject of group hospitalization has been discussed. I have heard some quite dissimilar opinions on this subject. I think most of us have a somewhat open mind on the subject with a tendency toward feeling there is enough good in it that it should be tried out. It certainly gives to the general public a feeling of security in the payment of hospital bills, which have become so heavy that they are a constant source of terror to the sick. As a result, they get money enough to pay hospital bills and forget all about the doctor bills. The great danger, as Dr. Packard said, is the including of medical care in this plan of group hospitalization. I don't believe in any place where they have tried to include medical care it has been successful. I was glad to see that Dr. Packard included in his report the tenets laid down by the Medical Economics Committee at the January meeting held here. The committee outlined some basic things that should govern any attempt toward group hospitalization.

Recently seventy hospitals in New York City decided to start a group hospitalization plan. The rest of the United States is going to watch very carefully what happens in New York, because if it can be made successful in New York, there is no question but what it will spread all over the United States in the large centers. The hospitals of Chicago have not as yet been able to get together on this subject.

As far as discussing sickness insurance, I shall not take any of your time. It is purely an experiment. Those of you who attended the meeting at Minneapolis and listened to the different reports of the different states in which it was tried, cannot help but come away with the feeling that none of the doctors are very much sold on the subject. It is an experiment and some good may come out of it, but certainly it has not as yet proven highly successful.

If you will permit me for a second to give a few personal opinions in regard to the whole problem of medical economics on which I have spent a little time in the past two years, I am going to try to answer a few little things that come up. In the first place, I believe the majority of our troubles will be over if and when prosperity returns. While we are going to have to sit tight and make the best of things as they are, we have two or three big problems ahead of us. We have to convince the general public and the politicians we are more interested in the care of the sick than any one thing before the public today. I think too often we have a tendency to forget that and give the impression we are doing this from a selfish viewpoint and interested more in the good of ourselves and the profession than the good of the public. Until we are able to convince both the medical profession and the laity in this connection, we are definitely on the defensive and we cannot afford to be on the defensive. To accomplish these things, we have to have a very open mind. We have to listen to the suggestions offered to us, we have to listen to some of the theories and even have to offer to cooperate with our critics in the trying out of some of their theories. It does not necessarily mean we must be convinced of all of them.

If we will do these things, we will have very little trouble in convincing the public we are not activated by selfish motives, and when that day comes they are going to listen to our suggestions and fall in line with what we have to say.

I want to congratulate Dr. Packard on his paper. I believe almost entirely in what he says. I think he has expressed it much more ably than I would have been able to do. I want to thank all who came here today and patiently listened to these programs. I am somewhat responsible for this program, I believe, because I suggested to some of the officers that we have this type of program and I want to thank the officers of the Secretaries' Conference, particularly, for their co-operation in regard to this great subject of medical economics.

MULTIPLE LIVER ABSCESSES

R. A. TEARNAN, M.D.
DECATUR, ILL.

Etiology.—The diagnosis of liver abscess is sometimes a very difficult one to make be they single or multiple, and especially is this so when with all the diagnostic facilities at hand, no cause or portal of entry can be found to account for the infection.

Suppuration of the liver presents itself in two forms, either as multiple abscesses or as a single abscess. In multiple abscesses there may be two, or the whole liver may be one mass of small and large abscesses. This condition is usually secondary to an infection elsewhere in the body, and as a rule is fatal to the patient. Surgical procedure in the multiple type of abscesses, according to many authorities is of little avail while the single abscess lends itself readily to aspiration, emetine and surgical procedures.

Distribution.—It has been repeatedly stated in the literature and in the text-books that single abscesses occur in tropical countries where amebic dysentery is very common. It has been shown however in late years that amebic dysentery is quite common in the colder climates, such as in Greenland, Labrador, Canada, Korea, and our own United States. It has been estimated that one out of every five persons residing in the United States either have the active ameba or the cyst forms in their system. If such is the case it is of prime importance that we know all we can about liver abscess, so that the management and treatment can be started as soon as the diagnosis is made.

Incidence.—Gessner, Herman B.[1] reviewed 96 verified cases of abscess of the liver recorded in the New Orleans Charity Hospital between the years 1918 to 1932 and found that men are more prone to liver abscesses than women, the percentage being 92.8% males and 7.2% females. Murray, Florence J. and Koh, P. K.[2] give somewhat similar figures, also many other authors too numerous to mention.

Causes of Liver Abscesses.—Keefer, Chester S.[3] reviewed 85 cases of multiple liver abscesses due to various causes and summarized them in an attempt to gather more precise information regrading the pathogenesis, the course and complications of hepatic suppuration.

He stated "inasmuch as infection reaches the liver by one of the following routes, the hepatic artery, direct extension from neighboring organs and through the radicles of the portal vein or the bile ducts, the cases were divided into groups according to the modes of infection which are summarized."

1. Thrombosis of radicles of Portal Vein:
   - Appendicitis ..... 16 cases
   - Gall Bladder Infection..... 1 case
   - Splenic Abscess..... 1 case
   - Strangulated Hernia..... 1 case with infected wound.

   19 cases
2. Primary Lesion in Portal Area:
   - No Pylephlebitis..... 22 cases
   - from Appendicitis..... 3
   - Typhoid Fever..... 2
   - Ulcers in Ileum..... 3
   - Carcinoma of Stomach..... 2
   - Amebic Dysentery..... 9
   - Multiple Abscesses..... (5
   - Single Abscess..... (4
   - Rectal Abscess..... 1
   - Bacillary Dysentery..... 1
   - Pancreatitis 1
3. Direct Extension into Liver Substance: 11 cases
   - from Empyema of Gall Bladder.. 3
   - Perforated Gastric Ulcer..... 1
   - Lobar Pneumonia with Empyema 4
   - Carcinoma of Stomach..... 1
   - Subdiaphragmatic Abscess..... 1
   - Carcinoma of Kidney..... 1
4. Extension through Biliary Passages: 13 cases
   - from Stones with Cholangitis.... 9
   - Carcinoma of Gall Bladder.... 3
   - Stricture of Bile Duct..... 1

   11 cases
5. Metastatic—Generalized Sepsis:
   - Staphylococcal Sepsis..... 5
   - Otitis Media..... 3
   - Leukemia 1
   - Tonsillitis 1
   - Cytogenetic Sepsis..... 1

   9 cases
6. Miscellaneous:
   - Actinomycosis 1
   - Tuberculosis 1
   - Hydatid Disease..... 3
   - Streptothrix Infection..... 1
   - Acute Pancreatitis..... 1
   - Cause Undetermined..... 2

Presented before Section on Surgery, Eighty-fifth Annual Meeting, Illinois State Medical Society, Rockford, May 22, 1935.

I believe the above summary gives one as complete an outline of the causes of liver abscess as one could find, also the percentages of incidence to any particular disease, such as 19 cases of appendicitis as compared to only 1 of pancreatitis as being a cause of liver abscess.

The most common cause for single liver abscess is amebic dysentery.

To the list of causes already enumerated should be added.

1st: Trauma, either from direct injury to the liver substance such as occurs in gun shot and stab wounds, or from a blow upon the external abdominal wall, which may reduce its vitality to such an extent that an abscess may be formed by organisms which invade the liver either by way of the circulation or through the alimentary tract.

2nd: Other unusual causes are

1. Round worms of the genus ascaris lumbricoides.
2. Foreign bodies, such as fish bones, the bacteria entering the liver through the punctured intestine.
3. Inflammation from a perinephritic abscess resulting from the perforation of a gastric or duodenal ulcer with resultant adhesions between the stomach and duodenum may extend directly to the liver.

In order not to make this paper too voluminous we will discuss, the mode of entrance, pathology, symptoms, complications, and treatment of the most common cause of liver abscesses, amebic infections.

Leonard Rodgers[4] suggests that the ameba reaches the liver by way of the portal circulation, that an amebic hepatitis is first produced, in which there is partial thrombosis of the smaller branches of the portal vein together with a reaction on the part of the tissue which keeps the ameba in the walls of the thrombosed vessels. When a number of adjacent veins of the hepatic system have been affected, so that they produce an early liver necrosis the ameba pass from the veins into the tissue and from an abscess. The large abscess develops within a fibrosed wall, and its extension is by the accumulation of material within this membrane without further disturbance of the liver tissue, while the multiple abscesses extend into the liver substance along the veins.

Councilman and LaFleur[5] say that liver abscesses may occur in the above manner but that they believe it more likely that the ameba reach the liver by way of the peritoneal cavity rather than by way of the blood or lymph vessels.

They believe the ameba enters the liver directly from the hepatic flexure, or they may pass from the intestine into the peritoneal cavity and then may wander or be carried like other insoluble material along the upper surface of the liver beneath the diaphragm, and that they may or may not produce peritonitis.

Pathology.—The liver is enlarged, the walls of the abscessed cavity are usually of a dark reddish brown color. The abscess cavity contains pus with detritus or broken down liver cells, red blood cells and crystals. The pus may be of a chocolate watery brown color, or a very thick white creamy type of pus. About 60 to 80% of all single abscesses are located in the right lobe of the liver. The abscesses vary in size from a few centimeters in diameter to large ones containing 3 to 4 thousand C.C. of pus.

The most frequent site for an amebic abscess is in the right posterior border of the right lobe of the liver and the abscess has a tendency to work forward to the diaphragm.

The contents of the abscess are usually sterile although sometimes amebae are found in the scrapings from the abscess wall.

If the abscess is a very large one the right lung may be compressed by the pressure from below the diaphragm, the lung may become inflamed from an extension of the abscess through the diaphragm, and later it may rupture into the lung.

Abscess of the liver may rupture into the peritoneal cavity, hepatic vein, inferior vena cava, bile ducts, pleura, into a bronchus after extension into the lung and may rupture through the skin, giving spontaneous drainage.

Symptoms.—The symptoms of liver abscess are very often masked by the symptoms of a general infection or by some other complicating disease. Usually the first symptoms are those of a generalized infection and it may take anywhere from two weeks to two months, before the symptoms and physical signs point definitely to hepatic abscess.

Usually the first symptoms complained of are loss of appetite, constipation, headache, and sometimes chills, fever and very profuse sweating. They may complain of body soreness, es-

pecially if an attempt is made to move them. The tongue is dry and coated, the skin pale or slightly jaundiced. The symptoms pointing to liver involvement are pain in the shoulder, enlargement of the liver, with tenderness and pain and slight or marked jaundice. In the deeply jaundiced patient he may have a cholangitis associated with an hepatic abscess, and there may or may not be stones in the gall bladder and bile ducts.

Pneumonia may be the first diagnosis made where there is an acute onset with chills and fever, dry hacking cough and pain at the base of the right lung.

The blood examination usually shows a very high leucocyte count ranging between 20,000 to 50,000 with a high percentage of polymorphonuclears in the differential count.

The symptoms of amebic liver abscess, may be only general malaise, with a slight or no rise in temperature, and this condition may go on for a long time before there is any sign pointing to the liver.

There is usually an intermittent fever, simulating that seen in malaria, ranging anywhere from 96 to 105. The highest point of fever usually comes on at a certain definite time of day and I think this point should be stressed.

On the other hand there are many cases on record where the patients never ran a temperature. The temperature of the patient in a well advanced case of hepatic abscess may show no elevation due to lowered resistance.

The pain complained of may be a feeling of fullness or it may be stabbing in character, it is apt to be of the stabbing type if there is an associated pleurisy or an acute inflammation of the surface of the liver.

Pain in the shoulder is quite a common symptom; also coughing is a symptom frequently met with and is due to iritation of the diaphragm or pleura.

Nausea and vomiting are usually associated with abscess or abscesses located in the left lobe of the liver. It also may be due to obstruction of the pylorus due to adhesions between the pylorus and liver.

Persistent insomnia, with depression and melancholy may also be present.

Physical Findings.—The most striking thing from the physical standpoint is the loss of weight which is usually progressive. In a well advanced case of liver abscess palpatation elicits definite tenderness over the liver and very often a markedly tender spot can be made out in the 9th interspace about two inches from the right costal border. Ludlow has emphasized the importance of this tender spot and it is now known as Ludlow's sign, and when present, together with the other physical signs and symptoms, is almost positive proof of the presence of liver abscess.

On percussion the zone of liver dullness is found to extend unusually high. With hepatic abscess in the right lobe of the liver percussion reveals the characteristic dome shaped area of dullness with the highest point in the mid-axillary line.

The discussion of the x-ray and laboratory evidence together with the diagnosis, differential diagnosis, prognosis, and treatment will be discussed in the taking up of Case 1 and Case 2.

Case 1. Mr. E. E. S., aged 49 years, occupation druggist, was first seen in consultation at a neighboring city on January 18, 1932.

He gave the following history:

Family History: Negative.

Past History: Negative, except for usual children's diseases, no history of diarrhea at any time, in fact said he had enjoyed unusually good health up to time of present illness. No venereal diseases.

Habits: Very good, never used alcohol or tobacco. Was a very hard worker, early to work in the morning, and stayed in his store until late in the evening, never took vacations, no recreation of any kind.

Present Illness: Began about November 26, 1932. He had been visiting his son who was a student at Northwestern University, Evanston, and on his return home complained of not feeling well, had no definite symptoms, except some nausea and vomiting and vague abdominal distress which at that time was thought to be nothing more than a gastrointestinal upset. He was at home for a few days when he returned to work feeling perfectly well again. About a week before Christmas he began to feel a dull type of pain in the right side, localized more in the region of the right kidney although it shifted at times to the right upper quadrant. The pain progressed in severity for about a week when it gradually subsided. He was at his store every day for several hours during this spell. About January 11 he began to complain of increasing pain in the costolumbar region, which became more and more severe during the day. His physician was called and he was put to bed and hypnotics administered. Pain gradually subsided in the following week until the pain was described as more of a feeling of tightness and fullness than of pain.

The pain never radiated to the right shoulder nor down the leg nor was there any relationship to the taking of food. He complained of slight nausea but has never vomited since the November attack. Had some chills and fever with sweating previous to January 1,

but none since then. Said the chills and sweating came on between the hours of 12 and 3 a. m.; from November 26 to January 18 had lost about 20 pounds in weight, and was feeling quite weak.

No heart or lung symptoms except an occasional dry cough and rather shallow respirations as though it hurt to breathe. No headache at any time. No urinary symptoms except slight burning on urination 2 weeks ago, lasting 2 or 3 days, no blood or pus noticed at that time; appetite poor, bowels constipated, no clay colored stools at any time.

Physical Examination: Patient had the appearance of one acutely ill. The skin and sclera were clear, no evidence of icterus, the nose and throat were normal, no palpable glands in the neck.

Chest: Heart was of normal size, heart sounds were clear and distinct, no tachycardia or arythmia. Lungs: Left, resonant throughout, no rales, no friction rubs, breath sounds clear and distinct. Right lung showed slight dullness at the base on percussion and on auscultation a few moist rales were heard at the base the rest of the right side of the chest was negative.

Abdomen: Appeared somewhat distended from gas, no evidence of ascites. On palpation and percussion the liver appeared to be normal in size. Kidneys and spleen could not be felt. On pressure over the abdomen there was no localized area of tenderness such as one might find in the region of the gall bladder or appendix. No masses were found on palpatation. There was a distinct area of tenderness in the region of the right kidney both posteriorly and anteriorly with a suggestion of a bulging in this area. Rectal examination was negative, no evidence of hemorrhoids or fissures. Prostate was small and rather firm. Genitals were normal. Both extremities, normal as to joints and muscles, no sign of skin rash, ulcers, or abrasions. Reflexes were all normal. His temperature at 9 p. m. was 102.5; pulse 110 and respiration 22.

Here was a man who appeared dangerously ill who presented very few symptoms, slight dry cough at times, fever, chills, and occasional sweating, and pain in the costolumbar region, with practically a negative physical examination. Except for pain on pressure over the right kidney region and a suggestion of bulging in this area and some signs at the base of the right lung, there was not very much evidence on which to base a correct diagnosis.

The possibilities thought of at the time of this consultation were perinephritic abscess, pyonephrosis, acute cholecystitis with empyema of the gall bladder, subdiaphragmatic abscess, liver abscess, carcinoma involving the liver, malaria, tuberculosis.

We advised his removal to the Decatur Macon County Hospital for further observation, x-rays, and blood examinations. He entered the hospital the next day. His temperature at that time was 101.4, pulse 110, respirations 22. Hot packs of boric acid and alcohol were applied to right side, urinalysis and blood count made which was as follows.

Urinalysis: Color amber, reaction acid, sp. gr. 1020, albumin heavy trace, sugar none, bile none, casts none, rare blood cells, few pus cells, no bacteria found.

Only a white count was taken on day of entrance which was 31,500; the second day in the hospital it was 32,350, the ninth day 57,300 and the eleventh day 74,540.

Blood cultures were taken on the second day, with negative results, no growth obtained.

Wassermann and Kahn tests were negative.

Blood smears showed no malarial parasites. Owing to the pain and soreness in the region of the right kidney, on January 20, the day after admission, an intravenous pyelogram was taken and the x-ray report as given by Dr. Faust was as follows:

Intravenous pyelogram shows the pelvis of the right kidney to be within normal limits as to size and shape. The calyces are also within apparently normal limits, and the function is good. The left kidney pelvis and calyces also appear within normal limits. Neither ureter is seen within its entirety which implies that they are functioning normally.

The bladder is shaped like the average.

Both kidneys appear to be normal.

Radiogram of the upper abdomen on January 21, two days after admission, did not show any suggestive evidence of air under either diaphragm. There is apparently no increase in the size of the liver.

Had air been present we would have had pretty strong evidence that we were dealing with a subphrenic abscess, the result of a perforated gastric or duodenal ulcer. But when air is not present it is sometimes a very difficult matter to distinguish between subphrenic abscess, and liver abscess.

We were trying desperately by this time to find the source of his infection and on January 22 aspiration of the right kidney region, the liver and subdiaphragmatic area was resorted to with absolutely negative results, so far as obtaining pus.

Repeated examination of the stools showed no cysts or active ameba, nor parasites of any other description.

On January 25 he was given a blood transfusion of 500 C. C. of whole blood and felt somewhat improved for a few days, his temperature during this time ranging from 101 to 97 degrees.

The chills, fever and profuse sweating continued with no change in the other symptoms, except that he was coughing constantly. There was increased dullness in the right chest on percussion and moist rales could now be heard over the entire right lung.

February 3 he was given a second transfusion of 500 C. C. of whole blood. His leucocyte count on February 1 was 66,050 and the day after his transfusion it had dropped to 37,950.

There had been no change in his symptoms or physical signs during this time, except increased weakness, cough and loss of weight.

Eollan, R. C.[6] remarked that characteristic symptoms are sometimes mixed with extraordinary ones, for instance in our case pain in the chest, so that the thought of liver abscess is invariably distracted, particularly so in the absence of elevated diaphragm, enlarged liver, and absence of jaundice.

There were definite symptoms and signs of pleurisy with effusion or empyema February 5 verified by x-ray

and aspiration of the right chest was done on that day, 1000 C. C. of a cloudy fluid was obtained. Microscopic examination: No bacilli found. No growth obtained on cultures. Guinea pig inoculation. No t. b. c. found. Two other aspirations were made in the next few days with sterile fluid obtained on all occasions.

On February 10 slight jaundice was noticed with some enlargement of the liver, which rapidly grew in size so that within the next few days it was felt three fingers breadth below the costal margin. Ludwig's sign was present on February 14 and on February 16 the patient was operated on.

A transthoracic incision was made and about three inches of the ninth and tenth ribs resected, the diaphragm was next incised which exposed the liver. When the capsule of the liver was incised a white thick creamy pus exuded together with necrotic liver tissue and detritus. The report on this material was that it was sterile. The abscess cavity was packed and wound drained. He was much improved for about ten days following this operation, and then his symptoms became much worse, nausea and vomiting, increased distention of abdomen, ascites, profound prostration. Death occured March 8, 1932.

Autopsy Report: External appearance. Greatly emaciated. There is moderate edema of the tissues of the lower half of the back and chest. The abdomen is moderately distended and soft. *Chest.* (Rt. pleural cavity only). The right lung is adherent over its entire surface to the pleura. The lower lobe is partially consolidated. The other lobes are normal. There is a localized area of empyema around the lower lobe posteriorily, containing about one-fourth pint of purulent material. There are adhesions to the diaphragm at this place, but no perforation of the diaphragm. *Abdomen.* The abdomen is filled with clear bile stained fluid. The stomach is distended to about three times its normal size. The duodenum is bound down by fibrinous adhesions to the liver and posterior peritoneum. The peritoneum is slightly inflamed over its lower third. The liver weighs 1625 grams. Both external and cut surfaces show numerous abscesses from about 1 mm. to 5 cm. in diameter. Some of these are ruptured and empty; most of them contain purulent material. One of the larger abscesses cavities communicates with a right lateral surgical incision which has almost completely healed. The G. B. is bound down by fibrinous adhesions and contains purulent material. Its wall is edematous and reddened. The spleen is enlarged to about twice its normal size and covered with fibrin. It is moderately firm. The cut surface is normal in appearance. The pancreas is approximately normal size, slightly edematous and very hard. Appendix normal.

Comment.—Multiple liver abscesses, coexisting with cirrhosis of the liver, a complicating empyema, and pyloric obstruction caused this patient's death.

Appendicitis, gall bladder disease, perforated gastric or duodenal ulcer, were ruled out early as a cause of the liver abscess. Not only the history and physical finding, but the x-ray and laboratory tests ruled out any of these organs as the primary focus of infection.

The presence of pus in the gall bladder, hepatic and cystic ducts found at autopsy was of the same character as that found in the abscesses in the liver, and we believe that it was an extension from a liver abscess along the bile ducts to the gall bladder, rather than a primary focus in the gall bladder. We believe this because of the character of the pus which was of a very thick creamy consistency and which was found to be sterile, not only at the time of operation, but also at autopsy.

While a cause could not be found to account for the multiple liver abscesses, we feel that the weight of evidence is more in favor of amebic rather than some other type of infection.

Case 2. The second patient presented definite symptoms, physical findings and roentograms, making the diagnosis comparatively easy, although the cause of his multiple liver abscesses could not be definitely determined.

History: Mr. A. G. aged 67 years, farmer, was first seen at the Decatur & Macon County Hospital, Decatur, Illinois, on December 7, 1933. F. H. negative. *Past History.* Said he had always been well in the past, except for an attack of diarrhea in October, 1933, which lasted about a week. *Present History.* He gave a history of not feeling well for past month and a half. Had lost about 25 pounds in weight during this time. Had severe chills and fever, and very profuse sweating in the past two weeks. Appetite was very poor, bowels constipated. When seen by us was complaining of very severe pain in the region of the liver and right shoulder. His temperature was of the intermittent type ranging from 104.6 to 97. Pulse 80 to 130 and respirations from 22 to 30.

Physical Examination: Skin and sclera were slightly jaundiced, tongue dry and heavily coated, nose and throat negative. No palpable glands in neck. Heart: Some enlargement but otherwise essentially negative. Lungs negative. Abdomen: Liver palpable about 2 fingers breadth below costal margin. Very tender to pressure. Abdomen otherwise negative. The rest of the physical examination negative as to genitourinary system, extremities, reflexes, etc. The blood count on day of admittance to hospital was 4,100,000 R. B. C. 26,800 W. B. C. The hemoglobin was 80%. Urinalysis negative except for heavy trace albumin. Blood Wassermann and Kahn tests negative. Stool examinations for parasites, ameba and cysts, none found. X-ray of the chest showed a slightly enlarged heart and a bronchitis most pronounced on the right side. The diaphragm appeared to be normal.

On account of the long duration of the fever, typhoid fever, tuberculosis, and syphilis had to be ruled out.

In addition pyelitis, hepatic intermittent fever of

Charcot, neoplasm, septic endocarditis, liver abscess and certain types of malaria also had to be excluded. By means of the x-ray, laboratory tests and physical examination all of these were excluded, except Charcot's fever, neoplasm and liver abscess. The diagnosis of liver abscess could be made with almost positive certainty on December 15 when an x-ray examination revealed a marked elevation of the right diaphragm when compared to the left. There was actually about a three inch elevation. This evidence together with the symptoms, physical findings and high leucocyte count made the diagnosis comparatively simple, and especially so in view of our experience with the other patient.

This patient was operated on December 16, a transthoracic incision being made, and resection of portions of the 9th and 10th ribs. Pus of the same thick creamy type as found in the first patient was drained from a large liver abscess, also drainage of the subdiaphragmatic abscess. The pus obtained was found to be sterile.

Patient died the following day and at autopsy the entire liver was found to be studded with many small and large abscesses, besides a large subdiaphragmatic abscess. The other organs were searched for gross pathology and none found aside from some congestion in right lung.

The same comment holds for this patient as in the first one.

We believe the etiology in both of these cases to be amebic, although as I stated before we have no definite proof for this assertion, therefore they will have to be classified as idiopathetic multiple liver abscesses.

CONCLUSION

When the etiology is obscure long continued fever, with chills, profuse sweating, extreme loss of weight, prostration, pain or sense of fullness in the liver region, elevation of leaf of the diaphragm, pain radiating to the right shoulder, together with a high leucocyte count should make one suspect the presence of liver abscess.

The mortality rate is high—20 to 80%. The 20% group are the patients with single liver abscess, while the 80% or better include those patients with multiple hepatic abscesses. Multiple liver abscesses are usually fatal. Surgical procedures should be attempted but they are apt to be of little or no avail.

Treatment for amebic liver abscess of the solitary type should be by aspiration, and filling of the abscess cavity with 1:1000 solution emetine 10 to 20 C.C. This method in Rogers' 111 cases yielded a mortality of only 14% while with open drainage his mortality rate was 56.8%.

According to Hargrove open operation should be employed.

1. In all abscesses of the left lobe.
2. Whenever the abscess bulges anteriorly.
3. When after aspiration pyogenic organisms have been found in the pus.

BIBLIOGRAPHY

1. Gessner, Herman B.: A Review of ninety-six cases of abscess of the liver. New Orleans M. and S. Jour., **85**: 793, 1933.

2. Murray, Florence J., and Koh, P. K.: Amebic Liver Abscesses, The Canadian M. A. Jour., **26**: 316-317, 1932.

3. Keefer, Chester S.: Liver Abscess, A Review of eighty-five cases. The New England J. of Med., **211**: 21, 1934.

4. Rogers, Leonard: Amebic Liver Abscess; its pathology, prevention and cure. Lancet I: 463, 569, 677, 1922.

5. Councilman, W. I., and LaFleur, H. A.: Amebic Dysentery, Johns Hopkins Hospital Rep. **2**: 395, 1891.

6. Eollau, R. C.: Amebic Abscesses of the Liver and Subdiaphragmatic Space. Archiv. für klin. Chir. **163**: 137, 1930.

7. Gessner, Herman B.: Abscess of the Liver, Amer. J. of Surg., **20**: 683, 1933.

8. Boland, Frank K.: Abscess of the Liver, Ann. of Surg., **94**: 766-775, 1931.

9. Hayes, S. N.: The Treatment of Hepatic Abscesses of Amebic Origin, Indian Med. Gaz., **62**: 13-14, 1927.

10. Mallory, William J.: Solitary Amebic Abscess of the Liver, J. A. M. A., **75**: 1774, 1920.

11. Sussi, L.: A Contribution to our knowledge of the Solitary Metastatic Arteriogenic Liver Abscesses, Med. Klinik, **28**: 611, 1932.

12. Dixon,. Claude F., and Murphy, George T.: Primary Idiopathic Abscess of the Liver, Collected Papers, Mayo Clinic, **23**: 247, 1931.

13. Aynesworth, K. H.: Abscess of the Liver, Chronic Form, The American Journal of Surgery, **20**: 672, 1933.

14. Recek, Ivan: Post Appendicitic Hepatic Abscess. (Subotica), Zentral, für Chir., **54**: 196-200, 1927.

15. Hargrove, M. D.: Treatment of Amebic Abscess of the Liver by Aspiration, New Orleans M. and S. Jour., **86**: 21, 1933.

DISCUSSION

Dr. J. R. Buchbinder, Chicago: Dr. Tearnan has emphasized very well the diagnostic and therapeutic difficulties in the treatment of this disease. I want to make merely a few comments relative to treatment.

We know, of course, that multiple abscesses, the result of suppurative appendicitis or cholangiitis or as a part of the clinical picture of pyemia, while they make interesting clinical pictures are of relatively little interest to the surgeon, because there is really no opportunity to do anything for these patients. In other words, pyogenic liver abscess is usually multiple whether it arises through the portal system or the blood vascular system, and is a very virulent infection. The outstanding characteristics of amebic abscess are first of all its latency because it is often found at autopsy with no clinical picture to suggest its presence. I believe the percentage of incidence of abscess as far as location is concerned is higher in the right lobe of the liver in comparison to the left than Dr. Tearnan gives. Most men writing from experience in the Tropics give the percentage as 85% in the right lobe and 15% in the left lobe, which is fortunate so far as the possibilities of surgical approach and treatment are concerned.

Amebic abscess is more commonly single than multiple. It nearly always rises deep in the substance of the liver. Two characteristics should be emphasized: first, in the beginning it is latent, and second, its tendency ultimately to rupture. There are some men who

have had experience with the treatment of amebiasis who feel that these abscesses should be treated as long as possible medically before surgical interference is thought of. As far as surgery is concerned, men writing from experience in the Tropics have a tendency to make the treatment a minor surgical procedure, to aspirate. First of all, I believe as many men do that the use of the aspirating needle in the abdomen, particularly around the costophrenic angle is a very dangerous procedure, because one can do more harm with a needle than with a knife and because if you are unfortunate enough to find the abscess with a needle or if one should transfix the lower portion of the diaphragm through the peritoneum, a spilling of pus along the side of the needle will occur. So when we open an abscess it should be through the abdomen with the peritoneum properly protected. When the location of the abscess is sufficiently clear, for instance in the right lobe, and it is obvious that it is pointing posteriorly, or at least we are certain that the posterior approach can be made with a fair degree of likelihood of reaching the abscess, it seems to me that the most logical approach is the one suggested by Ochsner some years ago for the drainage of subphrenic abscess; that is the resection of the twelfth rib, pushing pleura up, locating the abscess and getting free drainage extraperitoneally. Where we have to really look for the abscess, where we are not sure there is one, another method that compares in ease of attack and examination of the liver is that of the anterior approach to the anterior abdominal wall. If we have to drain the abscess anteriorly as we sometimes do when the abscess is on the free surface of the liver and is pointing in that direction, we can pack off the liver with gauze, put in a needle and if we locate the abscess we can, as I have had occasion to do twice in the last year in two patients in the Cook County Hospital, protect the peritoneum up to the liver and then get free drainage. It should be emphasized, of course, that seldom can we make a diagnosis of the etiology of the abscess from the pus itself. The ameba tends to lose its morphology in the pus itself, and only by examining scrapings from the abscess wall can we find the organism.

I think the things to emphasize are, that we should not use a needle blindly through the abdominal wall or chest, that we should get drainage posteriorly when possible, that we should avoid contamination of the peritoneum, that we should be sure we are not overlooking an abscess, which happens to all of us if we see enough liver abscesses.

Dr. R. A. Tearnan, Decatur (closing): I agree with Dr. Buchbinder in the idea of not aspirating patients with multiple liver abscesses. The difficulty, of course, comes in the fact that you do not always know whether you are dealing with multiple abscesses or with a solitary abscess. As Rogers said, in his 111 cases he has had a very low mortality rate by aspiration and injection of emetin. That is all well and good for the solitary types which are due to amebic infection, but where you have multiple abscesses that type of treatment would not do at all. You cannot possibly reach all of the abscesses where the whole liver is involved. As stated in the paper, in multiple liver abscesses there is not much that we can do. We can find them and try to pack them off. So far as curing your patient with certainty it is almost impossible. In these two cases that we had the liver was just one mass of abscesses. The abscesses were formed into a mass almost like a carbuncle. They were not only in the right lobe but also in the left lobe, so that I feel that when present as multiple liver abscesses they are practically always fatal, as stated by other authorities. In single abscess, if you are certain that you are dealing with a single one, I believe that Rogers' method is the best form of treatment, that is, aspiration and filling the abscess cavity with emetin. One may have to do two, three or four aspirations, and as the majority of Rogers' cases have been cured by this method of treatment, it should be the method of choice where one is dealing with solitary abscess of amebic origin. The multiple type of liver abscesses should be drained and packed, and single liver abscess should have the same treatment if the amebae is not the cause of the abscess or abscesses.

THE HYGIENE OF READING

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The hygiene of reading is concerned with whatever promotes comfortable, efficient and healthful reading. Reading difficulties may vary from "eyestrain" at reading efforts to complete reading disability. This vast subject has engaged the combined attention of ophthalmologists, neurologists, and educational psychologists. In the present analysis I have but attempted to outline the scope of the problem and to indicate the present orientation as developed from the most authoritative investigations.

Reading is but a phase of visual discrimination, and as such ocular, physical and psychical factors are simultaneously involved. Their spheres are more or less interrelated. As an instance:—A third grade boy was suspected of being feeble-minded because of poor reading ability. Though his vision was apparently normal the boy claimed that the letters looked as if someone had just put a wet blotter on them. After refraction and the proper correction, rapid progress followed. Had the defective vision been neglected, a psychic reading disability would have developed for which glasses alone would no longer have been adequate.

Read before the Joint Session at the Annual Meeting of the Illinois State Medical Society, at Rockford, May 23, 1935.

Ocular Factors

Under favorable conditions the eyes are not easily fatigued; but under unfavorable conditions in which there are difficulties with fixation, accommodation, adaptation, or interpretation, eyestrain is experienced (Lancaster[1]). In the effort to improve perception the eye instrument continuously attempts slight changes in adjustment; the muscles become tense, hyperemia and consequent hyperirritability result (Lebensohn[2]), and fatigue follows. Over short periods of time however the eye adjusts itself surprisingly well to poor conditions; the reading rate, for example, when printed matter is vibrating is practically the same as when stationary (Luckiesh and Moss[3]).

Errors of refraction or of muscle balance should obviously be investigated, and if significant, corrected. Nevertheless, any condition causing hyperemia of the eye such as the commonly occurring low grade conjunctivitis will induce similar discomfort; so one must not be misled into the error so frequently made by optometrists of treating such cases with negligible corrections, tinted lenses, or useless muscular exercises. Even though—as a consequence of such therapy—there are many who could "throw away their glasses," the greater part of the population errs grievously in the opposite direction.

In a recent study by the U. S. Public Health Service,[4] nearly 2000 unselected school children, ranging in age from 6 to 16 years, were carefully examined. Without cycloplegic, two-thirds of the group had normal vision; but under cycloplegic 43% tested as low as 20/50 or worse. Neher[5] reports that in 17 companies employing 83,825 persons less than 10% were wearing glasses, while 49% had defective vision. Among employes doing fine work, an increase of efficiency —averaging 20% followed the correction of refractive errors (Jacoby[6]).

Poor readers tend to show a limited peripheral field, exophoria for near, and decreased fusion amplitude. Though Eames[7] found that improvement of reading ability followed treatment of these conditions, it seems to me more probable that these functional defects are secondary to poor reading habits. Not infrequently also young pupils, in difficulty with their studies, find refuge in hysterical amblyopia (Robinson[8]).

However, the desirability of regular eye examinations for school children cannot be too strongly emphasized; and I suggest that they be made just prior to the summer or Christmas vacations so that the necessary use of a cycloplegic would not interfere with the class work. A clear perception of detail is most important in learning to read. Children report that they know "pig" by the dot over the i; "box" by the funny cross; "window" by the two ends being alike; "monkey" by its tail at the end, etc.

Outside of factors bearing directly on the visual process, mental receptivity is favored by a natural position when reading, a comfortable temperature, adequate ventilation, and the absence of distracting influences.

Physical Factors

For visibility there are four objective requirements:—*light, size, contrast, and exposure* period. It is noteworthy that above the liminal values, a deficiency in one component may be compensated by an increase in the value of one or more of the other factors (Lebensohn[9]). This accounts for the remarkable influence of ample illumination, which however is not sufficiently appreciated.

Illumination.—Starting from darkness, as the illumination becomes more intense, the visual acuity rapidly increases, reaching a practical optimum at 30 foot candles. Nevertheless such an amount of light is seldom utilized. Much reading is done with but 2 foot candles. To read easily diamond type at twenty inches requires 5 foot candles, which is the minimum advisable. The Illuminating Engineers Society recommends 10 to 20 foot candles for reading ordinary type, and 20 to 50 foot candles for the prolonged reading of fine type. Daylight quality is desirable. The fear of artificial light is common, but entirely unwarranted. Illumination in summer shade, though about 1000 foot candles, is easily tolerated. Pundit Pitkin, who holds that "Life Begins at Forty" weakens our confidence in his sapience, when we find in one of his books[10] an absurd discussion on the thesis that "Most of us who work in large city offices are in constant danger of overbright lights."

Light is seldom annoying on account of quantity, but often because of glare, due to its improper distribution in relation to the reader. Glare results when the eye perceives in the field of vision not only the print but also the source of light, either directly—as when one reads facing a window—or reflected, as from glossy pa-

per. To avoid glare, the principal source of light (for right-handed individuals) should preferably be behind and to the left; and local lighting should be supplemented by diffuse general illumination. Student eye shades are of value, and should be more generally used.

The recent perfection of the photoelectric relay and the illumination meter has made possible for light control what the thermostat and the thermometer have done for heat control. By this means the light in classrooms can be automatically adjusted to the minimum of illumination for which the relay is set.

Size. For the average adult the rate of reading is not greatly affected by change in type size between six and eighteen point, but the use of small type promotes rapid fatigue. Blackhurst[11] found 24 point type the optimum size for the first and second grades, 18 point for the third and fourth grades. College students read fastest and most accurately type of 10 point (1.5 mm.), and this is the standard size decreed for advanced textbooks in Russia and Germany.

Legibility varies with the style of type. Handwritten and typewritten materials are less legible than material printed in plain type. Because of the nature of the eye-movements in reading, too long or too short lines are equally fatiguing. The best length of line for 10 point type is 80 mm. (3½ inches) or about 16 words; and for this size of type the space between the lines should be 1.5 to 2 mm.

Contrast. Maximum contrast is desirable. Knitting white on white requires a greater visual acuity than knitting in contrasting colors. Books should be printed with a good quality of black ink on white or light yellow matt paper, thick enough to obscure the print on the opposite side of the page. Since soiled pages are hard to read, care should be taken to keep the sheets scrupulously clean.

Exposure period. The more favorable the visual conditions are, the faster is the speed of seeing. Bruecke found that the visual reaction time decreased in arithmetical progression as the intensity of the illumination increased in geometrical progression.

PSYCHIC FACTORS

The reading process. Eye-movements are as essential to reading as hand-movements to writing. A record of eye-movements reflects accurately the psychic processes involved in an individual's reading. A French ophthalmologist, Javal, in 1878 discovered that the motion of the eyes during reading is not continuous, but a series of movements and pauses. After a brief pause near the end of a line, the eyes shift rapidly to the beginning of the next line of letters. Because this last pause in a line is of somewhat shorter duration than average, proof-readers are more apt to overlook mistakes near the end of a line than elsewhere.

These eye movements may be observed directly through a hole in a sheet of reading matter, to the right of the reader, or—after prolonged gazing at a small wedge of bright red paper,—they may be subjectively noted through the appearance of after-images at the pauses. By focusing a beam of light on the cornea, a photographic record on motion picture film can be secured. This method, introduced by Dodge, has been recently developed and intensively investigated by the Department of Education at the University of Chicago.* The eye in reading only sees effectively when it stops. Consequently 95% of reading time is spent in fixation pauses. The interfixation movements are from two to seven degrees and consume about 0.03 second; the pauses vary from one-fifth to one-half second.

Change in the size of type causes no appreciable change in the character of one's eye movements. The span of an eye-movement is based, not on so many millimeters of space, but on the number of units that can be perceived, recognized, and remembered (Buswell[12]). The tachistoscope reveals that the mind can grasp at a glance three letters, four numbers, and as many words when aranged in meaningful order. Words can be read, even when the component letters are so small, that they could not be individually recognized.

Characteristics of good reading. Good reading is marked by recognition of large thought units, quickly and precisely; which on the eye-movement record corresponds to large fixation fields, short fixation pauses, and regular onward rhythm. Increasing the difficulty of a selection increases the number of fixation pauses and their

*The importance of this diagnostic procedure cannot be overemphasized, since through its use the particular basis of the reading deficiency may be ascertained. The ophthalmograph (a portable binocular eye movement camera) has been designed especially for these studies, and is adapted for both office and institutional use.

duration, and may introduce regressive movements. The eye does not move any faster than the mind, and when at any point in the reading the eye finds its perceptual span larger than the span of recognition, the eye moves backward to adjust itself to a smaller field. (Gray[13]).

By the time a pupil of normal ability has reached the fourth grade he should have developed fairly efficient reading habits. The analysis should show an average of seven fixations per line, an average fixation pause of 0.27 second and but occasional regressive movements. The reading will have improved in the high school period to five or six fixations per line, an average fixation pause of 0.22 second, and exhibit almost no regressive movements.

Intelligent adults, reading newspapers silently at their ordinary speed, will vary in rate from three to ten words per second. Paradoxical though it seems the fastest readers of a text are generally the best in its comprehension. Lacking the minor confusions incident to inadequacy in the mechanics of reading, their mind devotes itself wholly to the content. Tests among college students show that the fast readers are able to reproduce 37% more than the slow readers (Stockrahm[14]).

How to read rapidly. With training both the span of perception and of recognition can be developed so that individuals will read in large eye-fulls rather than in small ones.** Oral reading is much less efficient than silent reading both in speed and comprehension. Even lip-movements are undesirable and should be eliminated. Since children begin to read newspapers and magazines as early as the third and fourth grades the home should provide for them two or three of the better juvenile publications (Gray[15]).

Pathological Considerations

Reading while convalescing should be limited. As the whole body is below normal, the eyes as well as the body become easily fatigued.

Improvements in seeing conditions, though of advantage to the normal individual, give relatively greater assistance to the visually handicapped. Increasing the illumination from three to twelve foot candles benefits the vision of normal seeing eyes 14%, but of subnormal seeing eyes 22%; and at the same time there is lessened fatigue and an increased tolerance of refractive and muscular errors (Luckiesh and Moss[16]).

Myopia. Though myopia is not necessarily associated with overuse of the eyes, nevertheless protracted and intense near work in the adolescent period appears to favor its progress. In an investigation of apprentices in the printing industry, Duke-Elder[17] concluded that the work of compositors, which exacts the greatest degree of eye-strain, definitely encouraged the development and progress of myopia.

Semi-sight. Children with visual acuity between 20/200 and 20/70 requires special educational attention. In the sight-saving classes designed for this group, the books are in 24 point type, and reading exercises are limited to periods of ten to twenty minutes. One in 500 children belong in this caste, generally because of one of the following disorders: extreme degrees of myopia, hypermetropia, or astigmatism; corneal opacities, congenital cataract, chorioretinitis, albinism, nystagmus, or interstitial keratitis.

Age. The refraction in an aged individual must be periodically checked to compensate for the changes in the crystalline lens that may make for hyperopia, myopia, or astigmatism. Old eyes have additional impairments due to lessened transparency of the media, diminished focusing power, and a decreasing discriminatory efficiency of the retina. High intensities of light are an absolute necessity. It requires 27 foot-candles for a person at 63 to attain the same acuity that young eyes have with 2.5 foot-candles (Ferree, Rand, and Lewis[18]). Moreover, with an increase of illumination the range over which a presbyope can see with a given lens is considerably extended. A change of intensity from one to 25 foot candles may add as much as four diopters to the near point (Ferree and Rand[19]).

Psychic reading disability. Poor reading is very prevalent, affecting to a more or less extent one-eighth of the general population. (Monroe). Among school children the severe cases of reading disability number two to four per cent, dependent on the methods of teaching. The tendency is often hereditary.

The commonest cause of school failure is poor reading ability. It is frequently misinterpreted as laziness, apathy, or mental deficiency. Poor

**The average child in school has been given insufficient assistance in developing fast and accurate reading habits, and the recognition of this need inspired the development of the metronoscope, a training apparatus, which is adaptable to the various degrees of reading ability. The exercise with this instrument is of additional value in that it eliminates some of the close work in the young child's daily program.

readers are customarily discovered in the third or fourth grades when their inadequacy interferes with progress in other subjects. If their shortcomings are not then properly diagnosed and remedied, these children are doomed to educational failure and ultimate social maladjustment.

The older neurologists theorized of a "congenital word-blindness," and surmised for this group a developmental failure in the left angular gyrus. Modern psychologists doubt whether such a diagnosis is ever justified, and hold that all reading disabilities are to be explained on a purely functional basis.

Children with defective intelligence—having an I. Q. less than 70—cannot be expected to read with understanding. Other impediments are encountered with those whose meaning vocabulary has not been developed, or whose recognition and perceptual spans are limited. Most interesting however is the class suffering from confusion of ocular dominance. A large proportion of this group, 17%, are left-handed; and 26% though right-handed are left eyed (Dearborn[20]). The right-handed viewpoint has never been thoroughly assimilated. These children tend to read backwards, and so confuse such letters and words as p-q; b-d; u-n; w-m; was-saw; not-ton; dog-god; etc. Though unable to read, they may be quite intelligent in other fields, as mathematics or mechanics.

For the training of alexia cases special exercises have been developed. Among the most valuable is the tracing of words as they are read aloud, thereby associating kinesthetic, auditory, and visual imagery. Whereas, to the earlier students the prognosis was most discouraging, the present day workers feel highly optimistic concerning remedial treatment.

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BIBLIOGRAPHY

1. Lancaster, W. B.: Ocular symptoms of faulty illumination. Am. J. Ophth., **15**: 783, 1932.
2. Lebensohn, J. E.: The nature of photophobia. Arch. Ophth., **12**: 380, 1934.
3. Luckiesh, M., and Moss, F. K.: Researches in seeing. Am. J. Ophth., **15**: 801, 1932.
4. Kempf, G. A., Jarmon, B. L., and Collins, S. D.: A special survey of the vision of school children. Pub. Health Repts., **43**: 1713, 1928.
5. Neher, E. M.: Vision in relation to industry. Calif. & Western Med., **27**: 638, 1927.
6. Jacoby, M. W.: Vision in its relation to efficiency. Am. J. Ophth., **11**: 385, 1928.
7. Eames, T. H.: Improvement of reading following the correction of eye defects. Am. J. Ophth., **17**: 324, 1934.
8. Robinson, J. M.: Ocular manifestation of hysteria in children. Minn. Med., **13**: 618, 1930.
9. Lebensohn, J. E.: Factors in the determination and interpretation of visual acuity. Arch. Ophth., **10**: 103, 1933.
10. Pitkin, W. B.: The Art of Rapid Reading. McGraw-Hill, N. Y. C., 1929.
11. Blackhurst, J. H.: Investigations in the Hygiene of Reading. Maple Press, York, Pa., 1927.
12. Buswell, G. T.: Fundamental reading habits. Suppl. Edu. Monog. U. of Chicago, **21**: 1922.
13. Gray, W. S.: Summary of investigations relating to reading. Suppl. Educ. Monog., **28**: 1925.
14. Stockrahm, R. L.: The reading ability of college freshmen. Thesis. Indiana U. 1932.
15. Gray, W. S.: Improving instruction in reading. Suppl. Educ. Monog. U. of Chicago, **40**: 1933.
16. Luckiesh, M., and Moss, F. K.: Fatigue of convergence induced by reading as a function of illumination. Am. J. Ophth., **18**: 319, 1935.
17. Duke-Elder, W. S.: An investigation into the effect upon the eyes of occupations involving close work. Brit. J. Ophth., **14**: 609, 1930.
18. Ferree, C. E., Rand, G., and Lewis, E. F.: Age as an important factor in the amount of light needed by the eyes. Arch. Ophth., **13**: 212, 1935.
19. Ferree, C. E., and Rand, G.: Intensity of light in relation to the near point. Am. J. Ophth., **18**: 307, 1935.
20. Dearborn, W. F.: Structural factors which condition special disability in reading. Proc. Am. Ass. on Mental Deficiency, **57**: 268, 1933.

THE ALLERGIC INFANT

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The object of this paper is to consider the allergic conditions involving the infant up to two years of age. While the medical literature becomes more voluminous with articles on allergy, little attention has been paid to the problems of this age group. Unquestionably the treatment of allergy is not a panacea for all ills, but it does have a definite place in medicine and especially in pediatrics, for most authorities agree that results with children are much more favorable than with adults.

I'll agree that some of the following paragraphs may be somewhat elementary to the trained pediatrician and allergist, but in this field of allergy I doubt if we can as yet be too elementary. During recent years, I am sure that my added training in this field has made my problems easier and my results increasingly better. Perhaps we all must become a little more allergic-minded in regard to the infant. How often are we confronted with the asthmatic child, the youngster with hay fever, or the infant with hives, in whose case, if we search back in our minds or in clinical records of its infant feeding

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days, we will find the story of breast or bottle fed colic followed with mild or severe eczema associated with frequent attacks of head colds, croup and even bronchitis. In the past, perhaps we have all called these conditions underfeeding, overfeeding, catarrh and even pneumonia, but today we must consider some of them as different phases of allergy.

Heredity is probably the underlying cause for this entire group of diseases. Most investigators agree that in sixty per cent of cases the histories show one or more cases in other members of the family. Furthermore, it has been shown that where both parents are allergic, the offspring have about twice as much chance of suffering as when only one parent is affected; and where neither parent is a victim, the children are not likely to develop one of these diseases. It also has been demonstrated that the greater the hereditary influence, the earlier the symptoms of allergy occur in the offspring. Also, the children do not necessarily inherit the same disease; e.g. the parent may have hay fever, but the infant asthma.

The infantile gastrointestinal malady, so long known as colic, still seems to receive its share of combat in pediatric literature. The term may be a misnomer, but the malady, so distressing to both the mother and the physician, still continues to occupy an important place in the signs and symptoms of a crying infant. This condition has been variously diagnosed as underfeeding, gastroenteritis, indigestion, constipation, or what have you. When the mother, perhaps on the advice of a friendly neighbor, changes the type of feeding, it sometimes happens that the baby quiets down and soon begins to thrive. This seems to be miraculous, but such results are not surprising since the disturbance in a large percentage of these cases is undoubtedly due to a sensitivity to food.

For infants, the most common allergens giving reactions are egg, wheat and milk. In the case of milk Coca[1] states, "There is no convincing evidence, published or in our experience, that hypersensitiveness to milk is ever exhibited to the casein fraction." Furthermore Bowman and Walzer[2] say, "The caseins of most animal milks are practically alike, but the fact that sensitivity to casein is unusual, if in fact it exists at all, allows a successful substitution of some other animal milk for the one which the patient cannot tolerate." Goat's milk is, therefore, a valuable substitute at times.

The other protein fraction of all milks is lactalbumin whose allergenic powers are greatly altered by prolonged heating. Sensitivity to this alone may be almost immediately relieved by the use of the heated milks, such as evaporated milk, various dry milks, and hypo-allergic milks on the market. Prolonged boiling or autoclaving of cows' milk very often answers the problem; however, we have all seen the occasional patient who is so sensitive to milk that the mere ingestion of a few drops sets up a huge allergic reaction evidenced by fever, vomiting, gaseous distention of the abdomen, and generalized edema of the body. This infant must immediately be changed to a complete milk free diet. Such milk substitutes as Sobee, Almanlac, and Cemac may be used but these have not in my experience proved very satisfactory. Fortunately, milk sensitivity is almost always outgrown. After a few months of freedom, milk can usually be resumed.

Many investigators agree now that it is quite possible for the mother to sensitize the child during uterine life and during the lactating period. Egg and wheat proteins are the usual allergens in a mother's diet that cause gastro-intestinal disturbances or other allergic conditions in the infant, and the removal of these from her diet has repeatedly brought relief to the child. The same result is obtained by the elimination of wheat bran from the diet of the herd of cattle whose milk is being used for feeding the infant. I refrain from adding eggs to the milk diet, as was commonly done a few years ago, because I have so often seen children who have eaten eggs, or even played with egg shells, become acutely ill with vomiting, fever and giant hives.

Other important foods in the infant diet that may be responsible for so-called "allergic colic" are orange juice, tomato juice, cod liver oil, barley so often found in infant soups, tomatoes, carrots and other vegetables commonly added to the diet of a child around four to six months of age.

In the case of "allergic colic" two factors must be kept in mind. An accurate diagnosis and secondly the careful elimination of the foods causing the trouble. The avoidance of these poisonous foods in the young infant certainly will tend to stabilize its allergic balance and consequently reduce the incidence of other al-

lergic manifestations which so often develop in later life.

The second most common and important allergic disease encountered in infancy is eczema, a term applied to a characteristic skin rash usually beginning at two to three months of age and evidenced by an erythematous eruption on the cheeks. This soon becomes vesiculating and oozing and often spreads to the cubital spaces of the arms and the popliteal spaces of the legs and to other parts of the body. The appearance of these lesions may vary, but usually there is present the itching so characteristic of allergic dermatoses. Care must be taken not to confuse allergic eczema with other dermatological lesions present in infancy. As in "allergic colic," the ingested food proteins play the important role in the etiology of this disease, and among them milk, wheat and eggs predominate.

In the literature of today there is no other article so helpful in the management of infantile eczema as that of Louis Webb Hill's[3] in the *Journal of Pediatrics* of March, 1935. His classification is most practical and it, with his discussion, will help one to solve the ever increasing problems involved in the treatment of this disease.

In my experience I have found that skin testing is of little value on the infant under nine months of age because its skin is quite often so sensitive that even control tests mean nothing. With the older child the results are more satisfactory. In making the tests, I prefer the forearms to other surfaces of the body. It is true that less number of tests can be made at one sitting, but the reactions can be more reliably interpreted and the child will accept the ordeal of testing in a much more friendly state of mind if it can watch what is being done.

Intradermal testing with some of the more important allergens can be safely done provided previous scratch tests are negative. We have found that the passive transfer method, better known as "local passive transfer," even with its fallacies, is quite valuable in many cases, especially with those whose skins present many difficulties. Surely every puzzling case should receive a trial of this method. Oftentimes positive reactions so elicited are a great help in arranging elimination diets, which I feel are the most powerful weapons we have at our command to combat the dietary phase of infantile eczema.

It has long been thought that wool clothing and blankets, if not the whole cause, are at least irritating to an already developed eczema. Today, however, it is thought that the external allergens, such as silk, orris root, dust, animal danders, are, perhaps, secondary factors also, both as inhalants and contacts. Therefore, I feel that every infant with allergic eczema should have rubber covered pillows and mattresses.

Hypodermic desensitization, as a routine treatment for infants under two years of age, with some of these external or food allergens is hardly feasible. Oral desensitization with foods is possible and not dangerous, but is more valuable in the older age group of children than in the younger. Hansen's[4] results with the feeding of linseed oil and other investigators' results with corn and olive oil are very encouraging. I have had no experience with these methods so far. I feel that this warning should be given, however. Is the infant sensitive to corn on flaxseed? If not, will this method of management tend to sensitize it to these cereals? In topical treatment, coal tar is perhaps the most valuable medicant at our command.

Bronchial asthma, another important allergic disease encountered in infants under two years of age, is much less common than other diseases, but it is of much more serious consequence. The earlier the asthma, the earlier will serious chest complications make their appearance with resultant bony and chest deformities. In the early history of the child the chief complaint is often frequent chest colds which follow upper respiratory infections. These are accompanied by fever, dyspnea, cough, and at times, lung findings similar to those of pneumonia. Between attacks, these infants are usually free from symptoms, but as one spell follows another the two main complications set in; namely, emphysema and chronic bronchitis. These two tend to change the picture. The periods of complete freedom between attacks vanish, and instead we find that the patient is short of breath on exertion and coughs more frequently than before. Now the prospects for complete relief of symptoms become less bright, and the chronic asthmatic of later life seems inevitable; and this will be the case unless a rigid regime of treatment is closely followed over a long period of time. Pollen asthma is also possible in this infant group. I personally have treated with excellent results an

infant fourteen months of age who had seasonal ragweed asthma.

The treatment of the early infantile asthmatic is very satisfactory if it is based upon the causative or exciting factors of the disease.

There are many other allergic manifestations in infants, which are important. Conjunctivitis may be caused by sensitivity to soap; to medicants, such as neosilvol; to dusts, to pollens, and to animal emanations. The chronic running nose or the frequent head cold of the infant may be due to the cod liver oil in the diet, to the cosmetics used by members of the household, or to the pollen of plants. Other causes are the dusty feather pillow, the pet dog, the rabbit-hair toy, the teddy bear, and numerous other unexpected things. What part tobacco smoke in the home has to play as an irritant of the infant's very sensitive mucous membrane surface, I am not prepared to say. Unquestionably, however, this should be kept in mind as a possible factor.

Seasonal hay fever in the infant is rare, but perhaps may be more common than we realize. The future with its more accurate means of diagnosis, will, no doubt, add more light to this subject.

Bacterial allergy, if there is such, needs much thought and study by the pediatrician as well as by the allergist and otolaryngologist. Surely, some head colds are purely bacterial in etiology. What part then will respiratory vaccines continue to play in the prevention and treatment of infantile upper respiratory infections? Personally, I am very enthusiastic about the use of increasing doses of mixed respiratory vaccines that are given at regular intervals over a long period of time to reduce the incidence of so-called colds. House dust sensitization is, I believe, of equal importance and hyposensitization with stock house dust is incorporated in my routine management of this problem. Tabulation of my results awaits a longer period of time.

Other minor conditions seen in the infant which are thought to be allergic in character, and depend upon the location of the tissue or organ affected, are as follows: croup, serum sickness, contact dermatitis, pruritus, bladder and urethal spasms, hives, drug sensitivity, dermatitis venenata, mucous colitis, cyclic vomiting and perhaps some forms of purpura. Many personal experiences with such conditions of unusual character, I am sure, run through your minds and would be very useful to any physician who cannot help but realize that allergy has an important place in the study and care of infantile diseases.

The neurogenic factor in the allergic infant does not play such an important role as it does in the older individual.

In conclusion, may I repeat that the treatment of these various allergic conditions depends upon two things: a careful diagnosis and an accurate and thorough treatment. Successful management primarily depends upon a correct diagnosis which involves a detailed history, protein skin tests, and a thorough physical examination employing necessary diagnostic aids. Many times the history alone makes the diagnosis. What are the patient's contacts? What seems to be the causes? What gives relief? Is there an allergic family history? Does the patient have any other form of allergy? In most instances among infants, the history is much more important than is the skin testing. Skin testing is, however, a valuable adjunct to a careful history. It must be done thoroughly, accurately, and by one capable of correlating these definite findings with other factors in the case. It is not dangerous and is not especially painful. Evaluation of the tests is difficult for infants. The local passive transfer technique of testing, as mentioned before, is also valuable at times as a check on other tests. In some instances where both the scratch and intradermal tests are negative, valuable information can be obtained by careful conjunctival testing. Sometimes we know a patient is clinically sensitive to some proteins, yet he will not show positive skin reactions. It is most important to remember that every positive skin test does not mean that the patient is clinically sensitive to that particular protein. Skin tests are sign posts, valuable to lead the way but very dangerous if followed alone. Provocative testing by purposely reproducing the same disease, if it can be done safely, gives valuable information.

Secondly, the successful management of the allergic infant depends upon accurate and thorough treatment over a long period of time. Complete elimination of all possible causative factors is absolutely necessary, be they foods, animal emanations, house dust, pollens, or miscellaneous proteins. We as physicians must have at our command information on how to eliminate suc-

cessfully these causes, and be able to instruct the parent in the technique of elimination, and to make him realize the importance of it all. Hypo-sensitization is important and valuable in some selected cases. Truly this is not void of dangers, but it is necessary treatment for desensitization for house dust, cottonseed, orris root, and some animal emanations such as horse dander and dog hair. If this method is used by one well qualified and experienced, the results make worthy the trial.

The necessity for accuracy and faith in it ourselves as physicians must, of course, be our initial qualification. The parents will meet many adverse criticisms from laymen who will declare it all a fad or a racket. The course of treatment is long, hard, and expensive, but the results for the most part are gratifying, especially in the infant. The allergic baby certainly will make a healthier child if in early life it is deprived of the known offending substances.

In allergy the "unknown factor" still exists. The future certainly will help solve the problems now confronting the student of allergy. But even with our present limited information, we do not need to leave the allergic infant in the class of the incurables. We have already a good foundation on which to build, and a careful study of this phase of medicine by all of us will certainly improve the present and future health of our patients.

SUMMARY

1. The treatment of allergy is not a panacea for all ills, neither is it a fad or a racket.

2. The allergic infant needs the care of the general practitioner, the otolaryngologist and the pediatrician.

3. The diagnostic work to be done is not dangerous but must be thorough and accurate.

4. The results are better than those obtained in most of the other chronic diseases.

5. The allergic baby needs a foundation on which to build to avoid other allergic mishaps —give him a break.

REFERENCES

1. Coca, Walzer and Thommen: Asthma and Hay Fever in Theory and Practice, 1931, page 104, Charles C. Thomas.
2. Bowman and Walzer: Asthma and Hay Fever in Theory and Practice, 1921, page 427, Charles C. Thomas.
3. Hill, Louis Webb: J. of Pediatrics, 5: 405, 1935.
4. Hansen quoted by McQuarrie, Irvine: J. of Pediatrics, 5: 411, 1935.

DISCUSSION

Dr. I. H. Tumpeer, Chicago: This discussion unfortunately cannot refer as specifically as desired to the details of Dr. Cline's paper, owing to the fact that circumstances make it impossible for me to hear his discussion. From the abstract which I have seen, I am impressed with the fact that the important phases of allergy in infancy are covered.

I merely wish to emphasize the following factors. The allergic infant is that baby which the earlier pediatricians endowed with the name of diathesis. These babies manifest such conditions as eczema, pylorospasm, craniotabes, and other signs of rickets, frequently manifesting a persistent thymus. As they grow older, they develop other signs of allergy, namely, hives, asthma and hay fever.

An hereditary background may be determined in practically 100% of allergic infants. This figure is higher than is obtained in any other allergic group because more accurate histories are obtainable.

From the standpoint of the specialty of allergy, it should be noted that the etiology of specific allergic conditions in early infancy is usually bound up with diet. For instance, babies may be born sensitive to some food in which the mother indulged excessively during her pregnancy. Data have been collected indicating that the placenta is permeable to proteins. In other words, there may be such a thing as transmitted allergy. Of the foods, milk is probably the most important, eggs and cereals next, and vegetables least of all. On the basis of this grouping, many vegetable feedings have been devised, for instance, cemac, almond milk, and soy bean milk. It must be emphasized that inhalant substances soon become important; indeed, inhalants may be the only causative factor. Only recently, I have encountered two cases of widespread eczema on an inhalant basis.

Just as we have learned in infant feeding that any feeding materials will give good results if properly used, any method of testing will prove satisfactory if the potency of the testing materials and the experience of the physician are in proper balance.

In this fragmentary presentation I wish to emphasize one last thought which concerns the practice of clinical pediatrics. The allergic infant is a delicate mechanism which is easily disturbed. Disease processes play tricks on these babies, probably because of their unusual reactivity and provoke a response, frequently out of proportion to the disease. The allergic infant is apt to react in a violent and bizarre manner to infection.

It is a privilege for the pediatrician to hear the illuminating and mature account which Dr. Cline has presented.

Dr. Craig D. Butler, Oak Park: One of the biggest helps in the allergic problem in infancy is the history. The younger the child the simpler the history. I have found it a good deal of help in caring for babies of this type to have the mother keep a written log, not necessarily every day, but at the time of every flare-up in the asthma or eczema, so that we know every experience the baby has had in the last twenty-four to thirty-six hours and every food element he has taken. Comparing four or five of these flare-ups one often stumbles

on to some very definite antigen which is responsible. It is often of more help than skin testing to keep a careful history.

Dr. J. P. Burgess, Rock Island: I have thoroughly enjoyed this very complete presentation of Dr. Cline. There are one or two things I would like to mention. He brought out one point, that often manifestations of allergy are due to some other cause. Last year I saw an infant with eczema which flared up with local applications to the eczema. He was then six or seven months old. About two weeks ago they brought this infant in with asthma, which shows they do sometimes manifest their allergy by different diseases.

In testing these babies it seems to me that very often one gets as good results by starting in with some plan of elimination without going through the discomfort and major expense that is entailed by skin tests. Mention was made of the fact that we have relied almost entirely upon elimination, rather than upon desensitization in the treatment of the allergic infant. That is one point in which the handling of these infants differs from the handling of older children and adults. It was also brought out that there is considerable expense involved in the care of these babies, but it does not seem that the expense involved in going through the testing and elimination that is necessary is comparable to the degree of discomfort that these eczematous infants have to endure and the amount of work that the mothers have to do in care of the colic and vomiting in babies that have pylorospasm on the basis of some allergy.

Dr. G. F. Munns, Winnetka: I would like to emphasize one point about allergic testing. I believe that in the hands of the average practitioner it is not satisfactory for several reasons. In the first place, a considerable number of extracts are necessary and they should be kept fresh. In the second place, it is a rather meticulous task to do a number of tests on babies and children, and the average busy pediatrician does not have enough time to see that it is properly done. For that reason I believe the tests will be much more satisfactory if you refer the children you wish to be tested to men who specialize in doing that work. The results will be more accurate. I think that these are perhaps a few reasons why we have made rather slow progress in allergic testing. In the hands of the men who know how to make the tests and who use fresh extracts, in the great majority of cases the results are very satisfactory.

Dr. Henry E. Irish, Chicago: I have been very much interested in treating allergic patients from an allergic standpoint. I think we have been fortunate in having the paper presented to us by a man of national reputation. It perhaps affords us opportunity to ask a question or two. I have been much in doubt as to whether or not we should not have a re-definition of the term allergy as it was originally given to us by Pirquet and has by a process of extension and adaptation been used in the immediate past. I wonder if Dr. Unger could clear us up. You will recall, perhaps, when Pirquet introduced the term allergy he defined it as a reaction occurring after the injection of a series of doses of protein, the reaction being different from that occurring after the first injection of a protein. Is it proper to use the term allergy applied to reactions other than those of protein origin? Must these proteins be derived from food substances or can we consider bacterial proteins also as within the scope of the definition?

I have been startled at some of the statements that I have heard at meetings in which there has been an attempt to describe or include hyperreactions of all kinds as being allergic. Such things as epilepsy, hysteria and all sorts of hyperreactions which very properly may be conceived as being neuropathic in nature, are put down as allergic. Is there a variation in degree of normal defense reaction that is not produced by protein? If one analyzes, one sees nothing in allergy that is not contained in the normal armamentarium of defense of any animal. I could go into that in detail to show that these reactions are either those of muscle contractions or changes in secretion, which are the defense bases of all tissues. I believe that much of the difference of opinion in discussing allergy arises from confusion as to whether we are talking about allergic reaction to protein or about hyperreaction and insult to tissues.

Dr. Leon Unger, Chicago (closing): Answering Dr. Tumpeer, I do not believe that craniotabes is of importance in allergic conditions nor am I convinced of the role of the persistent thymus. There is no doubt that a child with an enlarged thymus can have difficulty in breathing from a mechanical viewpoint but this is not allergy. The typical prolonged expiratory wheeze of bronchial asthma is not present.

Milk sensitization is common in children but the older the person the fewer cases of trouble from milk do we find. Skin tests for milk, both cutaneous and intracutaneous, have not proven very satisfactory.

Answering Dr. Burgess, the fact that eczema is a forerunner of asthma was not emphasized sufficiently in Dr. Cline's paper. This is a very important point. In many of our asthmatics there is a history of eczema in childhood. I don't know how many cases of eczema develop bronchial asthma. It is very important to test children with eczema so as to prevent the onset of bronchial asthma in later life.

Skin tests before the age of nine months are unsatisfactory.

In children sensitive to milk, wheat or eggs desensitization can usually be accomplished by oral feedings. Where cooperation on the part of the parents is poor we resort to the hypodermic method of desensitization to these three foods. Desensitization is not used for other foods as they are not considered vital.

In regard to the point brought up by Dr. Munns, there is no reason why pediatricians should not make skin tests; the trouble lies in the fact that only a few pediatricians are making tests correctly. They are the ones who have complete outfits, which include about three hundred different materials, and they make the tests conscientiously and carefully. They are the physicians who should and probably are getting good results. Unfortunately, many pediatricians make ten or

twenty tests and inform the parents that the patients have been skin tested. To my mind such procedure is no more skin testing than a cursory examination of the tongue and palpation of the pulse constitute a physical examination. Such incomplete skin tests do more harm than good.

Intradermal testing should be used if the cutaneous tests do not give adequate information. The materials must be fresh and the injections must, of course, be made under sterile conditions.

Some pediatricians refer their allergic children to men more experienced in this particular line. I am sure that the allergists are perfectly willing to cooperate and refer the patients back to these pediatricians if they so desire.

I know that both Dr. Cline and I agree with Dr. Corper's remark about colic. Certainly, all colic is not allergic. Colic may be one of the earliest allergic symptoms.

Answering Dr. Irish, by anaphylaxis we mean artificial hyper-sensitivity; by allergy we mean natural hypersensitivity. The French confuse the two and frequently use the word "anaphylaxis" and divide it into animal and human.

We know very little concerning bacterial allergy. Cutaneous tests with bacterial proteins are almost invariably negative and we have long since given up this form of testing. Intracutaneous tests with bacterial proteins are frequently positive.

It is not necessary to ingest a protein to obtain an allergic reaction, as witnessed by patients who develop asthma or urticaria from aspirin or quinine. Landsteiner believes that such non-protein drugs combine loosely with the protein of the blood serum and that this combination breaks up explosively causing an allergic reaction.

True epilepsy is not allergic although a few cases have been reported where epileptiform convulsions have been definitely shown to be due to hypersensitiveness.

INTRAVENOUS MERCUROCHROME THERAPY

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CHICAGO

This paper is designed to present a case of general purulent peritonitis following acute gangrenous appendicits, which was rapidly cured by a single intravenous injection of mercurochrome. Owing to the advanced age and extremely low resistance of the patient, the sudden disappearance of the profuse purulent discharge from the peritoneal cavity, and the peculiar urine and blood findings following the injection of mercurochrome, this case constitutes an interesting addition to the report of 400 cases made in this journal in June, 1935.[1]

The patient, a white female, 48 years old, was suddenly seized with severe abdominal pains, which she attributed to indigestion. She took two Hinkle pills and an enema. Her condition became worse. She was examined about 35 hours after the onset of the illness, when a white cell count revealed 18,000 leukocytes. Appendectomy was performed immediately.

A right rectus incision was made and the peritoneum opened. A moderate amount of dirty brownish fluid was found in the peritoneal cavity. The appendix was 7 cm. long and 2 cm. wide. The serosa was dull gray to crimson in color, roughened and ragged, covered with plaques of purulent exudate. The vessels were engorged. The lumen showed a ragged and necrotic mucosa. The meso was thickened and infiltrated, rendering its ligature en masse impossible. The posterior aspect of the cecum was deeply injected. No distinct pus collection could be found anywhere. A cigaret drain was inserted and the abdomen closed. The patient was placed in Fowler's position and two hypodermoclyses of normal saline, 1,000 c.c. each, were given.

Events following the operation:

(a) *Purulent discharge.* The discharge from the drain, scanty and seropurulent at first, became gradually more and more abundant and purulent. About 80 hours after the operation it was so profuse that when the patient leaned over the right side the dressings (10 compresses and two large pads) would become soaked through and through within 45 minutes.

(b) *Abdominal distention, tenderness and rigidity.* The patient complained of distention and gas pains about 30 hours after the operation. A milk-and-molasses enema brought about the expulsion of flatus and a small amount of feces, with marked relief. Nevertheless, the distention and pains returned a few hours later, and another milk-and-molasses enema was administered—this time with little relief. A rectal tube was inserted. From this moment on the distention and pains persisted and became gradually more marked in spite of various measures, such as 1-2-3 enemas, pituitrin, repeated insertion of a rectal tube, and stupes to the abdomen. There was marked tenderness and a moderate degree of rigidity.

(c) *Vomiting and hiccup.* The patient drank water and tea, without being nauseated at all for the first 55 hours. At this time an effortless vomiting appeared, consisting of greenish fluid. It became more and more frequent, and about 100 hours after the operation assumed a distinctly fecaloid aspect with a repellant odor. With the fecaloid vomiting hiccup appeared.

(d) *Temperature.* For the first 84 hours following the operation the temperature ranged from 98 to 100. At one time it dropped to 97. At this time the patient received 1,000 c.c. of glucose, 10%, intravenously and 5 hours later 1,000 c.c. of normal saline by hypodermoclysis. The temperature rose to 100.4, but dropped again within four hours to 99.2. Another intravenous

1. Intravenous injections of mercurochrome in 400 cases. Arthur P. Martin. Ill. Med. J., 67: 539-551, June, 1935.

injection of 1,000 c.c. of glucose, 10% in distilled water, was administered, followed by a hypodermoclysis of 1,000 c.c. of normal saline within four hours. The temperature rose again and reached 102.4°F. per mouth 6 hours after the hypodermoclysis. It dropped again to 99.6 three hours later. Another intravenous injection of 1,000 c.c. of glucose, 10% in distilled water, was given about 11 hours before the injection of mercurochrome. This time the temperature remained about 99.6, although the patient's condition grew rapidly worse.

(e) *Pulse.* The pulse fluctuated about 70 for the first 40 hours. At this time it reached 85 and gradually rose to 104 about 90 hours after the operation. Then it followed more or less closely the rise of temperature attendant upon the intravenous infusions of glucose and hypodermoclyses of normal saline, reaching 138 when the temperature was 102.4. It dropped again to about 90 when the temperature returned to 99.6. However, when 110 hours after the operation the patient's condition became alarming and the fecaloid vomitings were persistent and harassing, the pulse rose to 108, whereas the temperature remained at 99.6—the first distinct indication of dissociation of pulse and temperature, which was to become gradually more and more accentuated. Within 8 hours it reached 120 to 125, while the temperature remained about 99.8.

(f) *Leukocyte count.* A white cell count made 70 hours after the operation revealed 8,650 leukocytes. Fifteen hours later it dropped to 4,950 and nine hours later it was only 4,000. About 105 hours after the operation, following two intravenous injections of glucose and two hypodermoclyses, it rose to 6,600 and a few hours later to 8,000—just before the injection of mercurochrome.

(g) *Urine.* On the day following the operation the urine contained traces of albumin, occasional epithelial cells, and some casts and debris. About 80 hours after the operation it contained a heavy trace of albumin, a few epithelial cells, and debris. Within 24 hours the albumin reached two plus and remained at this level until the time the mercurochrome injection was given. At the same time the casts and debris increased considerably in amount.

(h) *General condition.* On the third day the patient often complained that she "did not feel good." She became gradually more and more nervous and irritable. The face was pale and the eyes sunken at the time of the mercurochrome injection.

(i) *Blood culture.* A blood culture made about 36 hours before the injection of mercurochrome proved negative.

Injection of mercurochrome. It was given exactly 5 days (120 hours) after the operation. The dosage was about 6 milligrams per kilogram of body weight, based upon her weight before she became ill. It was started at 12:00 midnight and terminated at 12:04 A. M. Temperature 99.8, resp. 24, pulse 120.

Events following the injection: All temperature readings are per mouth.

12:15 A. M. Temp. 101, resp. 22, pulse 120. The patient feels warm and "gassy." She begins to belch noisily, bringing up a considerable amount of gas.

12:20 A. M. She vomits 10 c.c. and a few moments later 12 c.c. of a dark grayish, green fluid containing an abundance of debris. The belching continues, and the amount of gas expelled is so great at times that the patient almost chokes.

12:25 A. M. The belching is intermittent. Third vomiting of 12 c.c. of same material.

12:30 A. M. (30 minutes after the injection). Temp. 101.4, resp. 28, pulse 126. The bladder is catheterized, and about 2 ounces of urine are obtained. A typical mercurochrome reddish amber tinge is noted. It contains albumin two plus, and many casts, epithelial cells, and debris. Sp. gr. 1,035.

12:40 A. M. Fourth vomit of 5 c.c. of same material. The patient feels no difference in her condition. Her abdomen still aches. However, the abdominal distention is distinctly less marked.

12:45 A. M. The patient voids 15 c.c. of fecal material having about the same aspect as the vomit. The face is flushed. Rectal tube inserted.

12:50 A. M. Temp. 101.4, resp. 28, pulse 120. The patient belches again and vomits twice, the total amount of material expelled being about 40 c.c.

12:55 A. M. She vomits again 6 c.c. of the same material. She complains that she is tired and sits up in bed, asking for a hypodermic.

1:00 A. M. (1 hour after the injection). Temp. 101.2, resp. 26, pulse 120. Liquid fecal material mixed with gas is continuously flowing through the rectal tube into a glass urinal. The abdomen is softer and less sensitive to pressure.

1:05 A. M. The patient states that her abdomen feels better, although it still hurts. She does not feel so miserable and ill.

1:15 A. M. Temp. 101, resp. 22, pulse 118. She belches from time to time.

1:25 A. M. She vomits twice again, bringing up about 35 c.c. of the same material, which is becoming gradually thinner. She can turn over either side with great ease.

1:30 A. M. (1 hour, 30 minutes after the injection). The bladder is catheterized again. Seven c.c. of urine are obtained. A characteristic mercurochrome deep yellow orange color is present. Albumin, casts and debris are found in the same proportion as in the previous specimen.

1:35 A. M. Temp. 101.8, resp. 30, pulse 122. The patient belches from time to time and vomits 25 c.c. of same material. She feels much better. About 6 ounces of liquid feces have been expelled into the urinal through the rectal tube.

2:00 A. M. (2 hours after the injection). Temp. 101.6, resp. 32, pulse 126. The patient states that she feels over 50% better. She does not feel ill, and her mind is clear. The abdomen is quite soft and only slightly distended and tender. She can flex her legs with great ease. The dressings are changed; they are saturated with a faintly rose-tinted purulent discharge.

2:30 A. M. Temp. 101.6, resp. 30, pulse 126. Morphine sulphate, 1/6 grain is given.

4:00 A. M. (4 hours after the injection). Temp. 102, resp. 30, pulse 128. The patient slept at intervals and vomited 3 times, bringing up a total of about 20 c.c. The abdomen still hurts.

8:00 A. M. Temp. 101.4, resp. 30, pulse 120. The patient slept at intervals. Belching and vomiting less and less frequent. The dressings are changed; they are saturated with a thin seropurulent discharge presenting a rose tinge.

10:00 A. M. (10 hours after the injection). Temp. 100.4, resp. 28, pulse 120. She vomited about once or twice every hour.

2:00 P. M. (14 hours after the injection). Temp. 99.4, resp. 24, pulse 110. In the last four hours she vomited 7 times, bringing up a total amount of about 100 c.c. of dark, greenish fluid. She received 1,000 c.c. of normal saline by hypodermoclysis. She is nervous and restless at times, although she feels well.

9:00 P. M. (21 hours after the injection). Temp. 101, resp. 28, pulse 120. She vomited only four times, bringing up about 100 c.c. of dark fluid. She received another hypodermoclysis of 1,000 of normal saline. She had two evacuations of a dark brown liquid fecal material, totaling about 8 ounces.

6:00 A. M. (30 hours after the injection). Temp. 99.4, resp. 24, pulse 98. She vomited only three times, the amount expelled being about 5 ounces. She received 1,000 c.c. of glucose, 10% in distilled water, intravenously. Nervous at times, but feeling well. The abdomen is still slightly sensitive. The dressings are changed; they are saturated with a very thin serous discharge. No tinge of mercurochrome present.

11:00 A. M. (35 hours after the injection). Temp. 99.6, resp. 28, pulse 100. She vomited only twice, but was able to drink ginger ale. She feels very well and wants to know when she will get up. The dressings are changed. They are slightly saturated with a thin, watery discharge. The drain is removed with difficulty, the inner end of the gauze strip being stuck (it had not been pulled out for the last three days). Streaks of blood were present on the inner end of the gauze (the intra-abdominal portion of the drain measured 9 cm.). Cultures were made from the inner end and the middle portion of the gauze strip; they were found negative. A direct smear on a slide from the inner end of the gauze revealed one leukocyte per ten fields and no bacteria. A smear from its middle portion revealed one leukocyte per fourteen fields and no bacteria. The patient felt considerably relieved after the removal of the drain.

The recovery was uneventful. On the fourth day she developed diarrhea. She probably had about 15 bowel movements in one day. No blood was found in the stools. She felt very well. However, her appetite remained poor. She went home nine days after the injection of mercurochrome in good condition and able to walk.

Leukocyte count. Following the injection of mercurochrome the white cell count rose gradually until it reached 14,000 on the fourth day. It remained at this level with slight fluctuations for several days (see chart).

Urine. Daily urine analyses revealed that the kidney function became gradually better after the injection. Albumin, epithelial cells, casts, and debris diminished in amount. Only traces of albumin were found on the 9th day.

Blood analysis. The non-protein nitrogen content of the blood was 12 milligrams per 100 c.c. on the fourth day following the injection of mercurochrome and 25 milligrams on the seventh day.

Calculation of dosage. While it is an easy matter to calculate the dosage in an ambulatory patient or in one who receives the injection two days after the onset of the illness or the operation, it becomes very difficult to estimate it in a patient who has not been able to take any nourishment for several days and has been deeply dehydrated as a result of incessant emesis. In this case the loss of weight the patient may have undergone has been disregarded, and the dosage was based upon her normal weight—approximately 6 milligrams per kilogram. However, she received 5,000 c.c. of fluids in the form of hypodermoclyses of normal saline and intravenous injections of glucose within 36 hours before the injection of mercurochrome. If the loss of weight is taken into consideration, the dosage administered to this patient might have represented 6.5 milligrams per kilogram of body weight.

Preparation of the patient for the injection. In the paper which appeared in this journal in June, 1935, we recommended the restriction of fluids in ambulatory patients and those who are not dehydrated for at least six hours before the injection of mercurochrome in order to avoid too great a dilution of the drug in the body tissues. In this case we administered 5,000 c.c. of fluids hypodermically and intravenously with the purpose of correcting the dehydration and enabling the kidneys to resume their normal function. At the same time it was thought necessary to employ intravenous infusions of glucose in order to restore the function of the liver, which must have undergone damage as a result of repeated emesis. Had this high dosage been given before correcting the dehydration and carbohydrate starvation of the liver, mercurochrome might have caused serious damage to the kidneys and precipitated the patient's death. It is presumable that some of the cases of fatal outcome ascribed to this drug may have been due to an inadequate preparation of the patient.

Comments. This case presents many interesting points.

(a) The patient presented a low vitality as indicated by the low white cell count and the lack of febrile reaction in spite of the progress of the peritoneal involvement. Nevertheless, she was not affected at all by the injection of mercurochrome. Her kidneys functioned better than before the injection and the drug was rapidly eliminated.

(b) The reaction set up by mercurochrome was the mildest we have ever seen (we have given over 600 injections in the past nine years). There was not the slightest indication of a chill, and the temperature rose only to 102 per mouth. The pulse did not show any appreciable variation. There was no discomfort whatsoever attributable to the reaction. On the contrary, the relief was spectacularly rapid.

(c) Owing to the already established reversed peristalsis the patient evacuated a large amount of the bowel contents (gas and fecal material) per mouth.

(d) The diarrhea, which usually supervenes within 12 to 24 hours following the injection, did not appear here before the fourth day. The mucosanguineous discharge, which is rather common after high dosages, was entirely absent.

(e) The purulent discharge from the drain presented a characteristic mercurochrome tinge within two hours after the injection. This indicates that the peritoneal serosa was impregnated by the drug, which explains its speedy sterilization and the spectacular disappearance of the purulent discharge.

(f) After the injection of mercurochrome the leukocyte count rose rapidly and reached about 14,000, in spite of the fact that the patient improved steadily and evidently every focus of infection in the peritoneal cavity had been eliminated. It returned to about 10,000, rather suddenly, on the ninth day. The explanation of this phenomenon is not clear. One may assume that the blood forming organs, which had been so depressed before the injection, were stimulated and maintained a high degree of activity for several days. In previous cases in which the infection was more virulent and the injection was given within 2 days following the operation, the white cell count, very high before the injection (29,000 in one case, 19,000 in another), dropped at the rate of 1,000 per hour for the first few hours and continued falling until it reached a normal level.

(g) On the days following the injection of mercurochrome the nuclei of the polynuclear leukocytes presented pointed, instead of rounded, ends. This may indicate hyperactivity of the blood forming organs. The aspect of the nuclei became normal again on the fourth day.

Recommendations. On the basis of this case and the report of 400 cases made in this journal in June, 1935, the following recommendations are offered with regard to the intravenous use of mercurochrome:

1. The lowest reliable dosage is 6 milligrams per kilogram of body weight. While 5.5 milligrams may be sufficient in infections produced by microorganisms possessing a low resistance to antiseptics, this dosage is likely to fail in most cases. The dosage of 5 milligrams recommended by Hugh Young as high was found absolutely insufficient.

As we pointed out in the previous article, the results of intravenous mercurochrome injections depend on—(1) the degree of resistance of the offending microorganism, and (2) the blood supply to the structures involved. Consequently, there is no absolute minimal or maximal dosage. Even 6 milligrams per kilogram may be a low dosage in many cases. *Underdosage, absolute or relative, is the only cause of failure.* What one must seek is a *direct bactericidal effect* and not a bacteriostatic one. It is because the previous experimenters were relying on bacteriostatic effects that they failed to reach their goal. No one probably registered as many failures as the author, but it was the failures that pointed the way to success, which lies exclusively in the use of high dosages. It must be emphasized here that *it would be a disaster to miss the correct dosage in rapidly fatal infections;* the patient will die from the effects of the unarrested infection before he recovers sufficiently from the reactional mercurochrome disturbances to be able to receive a higher dosage. *In the face of a critical situation it is by far better to lean toward an overdosage than toward an underdosage.* The author has in numerous cases resorted to dosages of 6.2 to 6.5 milligrams per kilogram of body weight without any mishap. However, one must be certain that the kidneys function fairly well.

2. In ambulatory patients and in those who have been ill for only a short space of time the fluids should be restricted during the six hours preceding the injection of mercurochrome. Extensive experience has led us to the belief that the *secret of success with intravenous mercurochrome therapy lies in raising the concentration of the drug in the body tissues to a degree that will render it bactericidal within a short space of time.* Indeed, mercurochrome is eliminated rapidly. Already half an hour after the injection the urine presents a distinct orange tinge, which becomes darkest within about three hours.

3. In patients who as a result of prolonged illness are depressed and dehydrated it is necessary to correct the dehydration by hypodermoclysis of normal saline and intravenous injections of glucose before administering mercurochrome. If this precaution is overlooked, the kidneys, temporarily inhibited, may not eliminate the drug, and toxic effects may arise therefrom.

4. In obese patients a deduction of 1/5 to 1/10 of the total weight, according to the degree of adiposity, must be made in calculating the dosage. Thin persons should receive the full dosage corresponding to their weight.

5. The intravenous mercurochrome therapy must be resorted to before the kidney function is deeply impaired and the myocardium degenerated.

Summary. A case of general purulent peritonitis following acute gangrenous appendicitis was treated, with overwhelming success, by means of a single intravenous injection of mercurochrome. The profuse purulent discharge emanating from the peritoneal cavity disappeared entirely within 35 hours following the injection, and the intraabdominal portion of the gauze strip, when removed at this time, gave negative cultures. The reaction set up by the injection was so mild that it caused no discomfort whatsoever to the patient; there was no chill, and the temperature rose only to 102 per mouth. Daily urine analyses revealed that the condition of the kidneys, as indicated by the amount of albumin, epithelial cells, casts and debris, was better after than before the injection of mercurochrome. The leukocyte count, which had dropped to 4,000 before the injection, rose to 14,000 after it and remained at this level until the ninth day when it suddenly fell to 10,000. The nonprotein nitrogen content of the blood was 12 milligrams per 100 c.c. on the fourth day following the mercurochrome injection and 25 milligrams on the seventh day.

55 East Washington Street.

BLOOD

Date	9-3-35	9-6-35	9-7-35	9-8-35	9-9-35	9-10-35	9-11-35
	Appendectomy		Mercurochrome				
Erythrocytes per c. mm.			4,260,000	4,080,000	3,960,000	4,080,000	
Leukocytes per c. mm.	18,000	8,650	4,000	8,000	8,800	9,450	10,600
Erythrocytes, color							
Small lymphocytes	10%	15%	2%	4%	8%	5%	6%
Large lymphocytes	3%	8%	6%	5%	4%	11%	9%
Large mononuclears							
Polynuclear: Neutrophiles	79%	71%	76%	78%	66%	57%	70%
Eosinophiles							
Myelocytes	4%	2%	13%	7%	12%	19%	6%
Myeloblasts							

BLOOD

Date	9-12-35	9-13-35	9-14-35	9-15-35	9-16-35	9-17-35	9-18-35
Hemoglobin							
Erythrocytes per c. mm.	3,500,000	3,740,000	3,960,000			3,580,000	
Leukocytes per c. mm.	14,600	12,500	16,400	13,900	11,700	13,400	10,800
Erythrocytes, color							
Small lymphocytes	4%	6%	2%	4%	16%	4%	2%
Large lymphocytes	3%	10%	19%	6%	10%	7%	19%
Large mononuclears							
Polynuclear: Neutrophiles	84%	79%	73%	82%	73%	79%	75%
Eosinophiles							
Myelocytes	5%	3%	1%	3%		4%	1%
Myeloblasts							

THE TREATMENT OF LUNG ABSCESS AS JUDGED BY 101 CASES

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During the years 1933-34 more than 160 patients were admitted to the Cook County Hospital with a diagnosis of lung abscess. Definite diagnostic criteria must be applied to any group of patients to determine the true value of different modes of treatment. Expectoration of large quantities of foul pus in patients after a "cold," pneumonia, or operation about the upper air passages combined with dullness, large moist râles, and changes in breath sounds were highly suggestive of a lung abscess. X-ray films of the lungs usually confirmed this suspicion, while bronchoscopic examination and post mortem records authenticated the diagnosis. Some of the group had only one of these diagnostic features, while a majority had two or more. No case of tuberculous abscess as considered in this study. With the exception of three cases of multiple abscesses, all were classified as solitary.

The treatment was considered under four main types.

General Medical Care. General medical care constituted the first group. Bed rest, adequate nutritious diet, and proper postural drainage were the essentials. Supportive measures as liver extract and ferric ammonium citrate for anemia; antipyretics for high fever; and phenobarbital, chloral hydrate and bromides were given for sleeplessness. The amount, character, and microscopic examination of the sputum should be recorded daily as it furnishes a good index of the progress of the patient.[1] Ten cases whose sputum contained spirillae and fusiform bacilli of Vincent were given intravenous injections of neoarsphenamine in 0.15-0.30 Gm. doses every 6 to 14 days with excellent results. Two drugs were used in an attempt to influence the character of the sputum. Creosote and guiacol carbonates in 1-3 Gm. doses were given daily to 12 patients with no evident beneficial effects. In one patient large doses of potassium iodide, grains xxv-xl daily, were administered in an attempt to thin the secretion. The patient grew steadily worse and died 12 days after this treatment was begun. It appeared that not only had liquifaction of the bronchial secretion taken place but also of the wall of the abscess; a gradual increase in the size of the abscess had taken place so that at death it involved more than half the lung. Good general nursing care was therefore the main treatment of these patients.

Too little attention has been given to this phase of the treatment, despite the fact it has been repeatedly advocated over a number of years.[2-3-4-5-6-7] A number of years ago Dr. Jesse Gerstley pointed out that when we treated the child, not the stool, remarkable progress was made in pediatrics.[8] This principle is emphatically true in the treatment of lung abscess. If we treated these patients more and the abscesses less better results would accrue.

Postural drainage deserves special mention. Many methods have been suggested to accomplish gravitational drainage. These include: special beds, head-rests, mattresses, even tightly laced boots that are strapped to the foot of the bed so that the patient actually dangles in bed by his feet.[9-10] The aim of all postural drainage is to have the patient's head and chest lower than the pelvis. Simply elevating the foot of the bed by extention legs or putting a chair, table, or wooden horse under the lower cross bar of the foot of the bed will accomplish this desideratum. Beds equipped with castors must have them removed before tilting or they must be firmly anchored by suitable blocks. Any elevation more than 5° with the floor is annoying to the patient as he continually tends to slip down toward the head end of the bed. Shoulder braces similar to those used on operating tables for the Trendelenburg position have been suggested.

Too fairly firm pillows or sand bags on either side of the bed with a space for the head will achieve the same end. The pillows rest against the supporting bar at the head end of the bed and are of sufficient length and firmness to prevent the patient's head from striking the head of the bed. Ordinary pillows folded across the middle worked well.[11] They were found to be large enough to brace the patient's shoulders and keep the top of his head at least 4-6 inches from the upper end of the bed. It is preferable to

From the Medical Service of Dr. Don C. Sutton, Ward 15. Read before Section on Medicine, Illinois State Medical Society, Rockford, Ill., May 22, 1935.

incorporate these improvised shoulder braces as part of the bed. An additional draw sheet spread lengthwise across the top of the pillows and firmly drawn in at the side of the mattress is needed. Six or more safety pins or ordinary cotton tape will fix the pillows in position, prevent them from shifting, and serve to draw up any creases in the sheet, thus providing a more comfortable space for the head.

The amount of tilting varies with the condition of the patient. In large or recently ruptured abscesses angles of 8-11° are needed. Some patients will find this uncomfortable. If so, they can be put up at 11° for one hour twice or thrice daily and then restored to 5° for the remainder of the twenty-four hours. Practically none objected to prolonged 5° elevation of the bed.

Many patients complained when the bed was first tilted. Fullness in the throat, throbbing of the vessels of the neck, headaches, transient

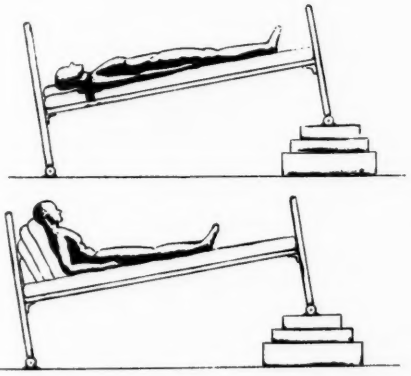

Fig. 1. Upper drawing. A postural method that effects gravitational drainage. Shoulder braces, shown in black are necessary.

Lower drawing. The common error of allowing the patient's head to be braced by a few pillows, thus substituting the Jack-knife position for that of gravitational drainage and defeating the aim of postural treatment.

vertigo, and even nausea were experienced. All disappeared within 3-4 days. Some patients can not tolerate more than a 10° elevation without persistent complaints, others will not object to a 12° angle. This uncomfortableness may defeat the aim of postural drainage. Left to themselves, many patients attempt to correct these slight symptoms caused by the new position, by slipping one or more pillows under the head. Occasionally they build up such large head-rests that their pelves are actually lower than their heads and chests. This substitution of the jack-knife position for that of postural drainage will prevent any gravitational flow of pus, despite great tilting of the bed. (See Fig. 1.) A brief explanation of the aim and effectiveness of this type of treatment should be given to both the nurse and the patient before the bed is tilted. With their co-operation an effective gravitational drainage of pus and secretion will follow, rather than a compromisingly comfortable postural attitude. Some patients will object to the vile smelling and bad tasting sputum that is expectorated. Mild astringent mouth washes and warm alkaline aromatic gargles will overcome this objection.

When it is evident that simple tilting of the bed is not effective, drainage should be reinforced by additional gravitational methods. These include: having the patient hang over the edge of the bed (Von Quincke position), lie across the bed with the head down, or support himself in this position with his hands on the floor.[12] During this time it is important to have the patient take deep breaths to encourage a more complete emptying of pus. A 10% carbon dioxide mixture in oxygen has been suggested.[1—13] Having the patient breathe in a stout paper bag will accomplish this. The frequency and length of these postural changes depend upon the amount of expectoration and the condition of the patient. Usually 4-7 times daily are sufficient. It was found advisable to cover a portion of the floor on which the pus basin was placed with large sheets of paper. With the expectoration of large amounts of pus there is generally some soiling of this paper which can be destroyed by routine incineration. In this way the floors and surroundings are kept clean and the spread of infection is reduced.

The integrity of the cough reflex largely determines the success of postural evacuation.[14] Codeine and opiates are specifically contraindicated in lung abscess. A deadened cough reflex will allow pus to accumulate in the bronchi and stagnate or be aspirated into neighboring bronchi. It is a frequent bronchoscopic observation that the field may be aspirated entirely free of pus, only to have pus well up from the affected bronchus after a slight cough. Dr. Chevalier Jackson[15] has aptly called the cough reflex the "watch dog

of the lungs." He describes the evacuation of secretion and foreign material from the larger bronchial tubes by the forceful expiratory gust during a cough as the "bechic blast." More effective than this is the actual squeezing down of the lung on itself—the tussive squeeze. These combined with cilial activity are powerful methods of evacuating pus, débris, and foreign bodies from the lungs. Loss of the cough reflex paralizes this activity and allows the pus in the abscess to stagnate. When should we begin postural drainage? As soon as a patient is suspected of having a lung abscess this treatment should be instituted. If all patients with a significant history and physical findings were given this therapy at the outset few chronic abscesses would develop. In a previous paper[16] it was pointed out that the earliest physical signs of abscess are dullness to percussion, fine moist râles, and suppressed breath sounds. This is the ideal time for gravitational drainage, since the abscess walls are thin and resilient. As soon as rupture occurs, the cavity will tend to be more completely evacuated by postural means, the soft walls collapse and healing by fibrosis begun. Sante[17] cites a case of complete disappearance of inflammatory consolidation 3 days after rupture and evacuation of the abscessed cavity. Later, if untreated, increasing dullness, large moist râles, and harsh breath sounds were heard. These denoted a less yielding wall, in which evacuation by postural methods might be just as prompt but a collapse of the cavity less certain. Patients seen still later in the course of the disease without any treatment, often present flatness, bronchial or amphoric breathing, increased tactile fremitus and more rarely whispered pectoriliquy. When these signs are present a thick walled rigid cavity has formed. The beneficial effects of postural drainage is marked though not curative even in these patients. Partial or complete emptying of these cavities is accomplished, and the decrease in toxic absorption probably accounts for the marked improvement in these patients.

Thirty-six of the 101 patients were given general medical treatment including postural drainage. Of these 21 improved, 5 were unchanged, and 10 died. Improvement was accepted only in those patients that had a complete absence of all symptoms, a gain in weight and strength, no abnormal physical signs, and x-ray films showing healing by scar tissue. A betterment of symptoms with persistent physical signs, or vice-versa, unwillingness to remain in the hospital or slight to no change of the patient constituted the unchanged group. Duration of treatment was judged by average length of hospital stay. The improved group required 29.5 days, the unchanged 13.4, while those that died were in the hospital 16.4 days. Many patients in this entire group were considered too sick to be given any other form of treatment, but in spite of this the mortality for the group was 27.8%. (See Tables No. 1, 2, 3.) Funk[18] studied a series of 50 cases, 34 of whom received medical treatment alone with a mortality of 10%. Similar results were noted by Marietta,[12] while the surgically treated cases had an almost 50% mortality. Rest and postural drainage has been observed to be followed by good results in many cases.[19-20-21-22]

Bronchoscopic Aspirations. A second, slightly larger group of thirty-seven patients were given bronchoscopic aspirations in addition to the routine medical treatment. The Ear, Nose, and Throat Department of the hospital did all the bronchoscopic work using a modification of Jackson's technique.[23] I wish to thank Dr. Thomas C. Galloway, the chief of this service, for the kind attention and friendly interest he took in this work and for the numerous suggestions as well as the pleasant encouragement. This combined form of treatment gave more favorable results. Twenty-four cases were improved, five remained unchanged, and only eight died: a mortality of 21.6%. Treatment was carried out over a longer period of time (Tables 2 and 3). The improved class stayed 54.5 days, the fatalities 55.2 and the unchanged 37.8. One to 8 bronchoscopies were done, an average of 3. All except one of the unchanged class had a single aspiration. A single passage of the bronchoscope, as well as other things, seemed to be sufficient grounds for 4 patients to demand immediate release from the hospital. In both the improved and those who died, an equal number of aspiration were done.

Others have reported 50-79% recoveries following rest, posture, and bronchoscopy.[5-18 24-25]

Even more noticeable than the improvement in a number of this group was the striking betterment after a bronchoscopic aspiration. The records of 15 patients had notes of "better" and "much improved" after this procedure. This

is particularly significant in that it comes from different interns on the various services, in whom no special bias or prejudice can be supposed. A careful review of the clinical course and nursing records of these patients substantiates this statement. After histories of the group show that only two died. One died from an intermittent hemorrhage from an eroded branch of a pulmonary artery, the other complained of nausea, vomiting, and abdominal distention and the lung abscess was found only by physical examination. In this latter no post mortem was permitted and the exact cause of death undetermined.

Three patients were too sick to have repeated aspirations and were given only one. They were then given general medical care alone, but to no avail.

Surgical Treatment. A heterogenous group of procedures have been gathered under this head. Twenty-three patients in whom 30 operative procedures had been done were considered. Since there were 7 patients who had more than one operation, it was thought less confusing to evaluate each procedure rather than each history. By necessity we were forced to class first stage operations or phrenicotomies as improvements when they were followed by second operations. This was often not true, as the patient still had the disease and required a second operation. The figures are really a little more encouraging than those subjected to the more harsh arbitrary standards of the other two groups.

Phrenictomy was done on 8 patients and 6 improved. Two of the latter had to remain in the hospital about 40 days (See Tables 2 and 3). In the other 4 it was followed by a second operation viz., rib resection, thoracoplasty, and lobectomy. Two patients died after this nerve section, a mortality of 25%. Pneumothorax was attempted four times in a single patient in the hope of collapsing the middle right lobe cavity. On the third attempt the lung was collapsed and the patient improved slightly. However, one month later she developed a chill, cough, and fever and died 4 days after the last air injection. Thoracentesis, hardly a surgical procedure, was added to the list mainly to point out the grave dangers of a hasty exploratory puncture often done with an inadequate estimate of the real condition or its consequences. Ten patients were punctured, 4 improved, but the rest died. Two of the improved patients had "dry taps," another was followed by a rib resection, and small amounts of bloody fluid could be aspirated with difficulty in the fourth. Sixty per cent. of all patients (6) in whom thoracentesis was tried died. An average of 10.3 days elapsed between the operation and death. Less than 35 cc. of thick yellow pus could be aspirated in three cases. Spontaneous rupture of the abscess must have occurred in two men as 500-600 cc. of free pus was found in their pleural cavities.

A two stage thoracoplasty was tried in three men. A 26 year old white male had the operation more than 1½ years ago and is still well. Another patient recovered from the first stage and returned for the second stage three months later. He showed slight improvement after the second operation, but died within the next month. A third patient died immediately after the first stage operation.

Insertion of a drainage tube was so frequently associated with a rib resection that they are included under one head. Of the 7 patients treated by this method 3 improved while 4 died. An inch or more of the seventh rib in the midspinal line was removed in one case and a similar section taken from the 8th rib of patients who improved. A third case who improved had a resection of the 6-7 ribs, but he developed a bronchial fistula. An average of 24.3 days elapsed after the operations until the improved patients were allowed to go home. Two of the 4 patients who died had small sections of the 6-7-8th ribs removed. Another man had a small rubber drainage tube inserted which provoked a fatal bronchial fistula, while the fourth had an extensive resection of the 8-9-10th ribs.

No Treatment. Six of the 101 cases properly belonged to the group of untreated cases. An 11 day old infant was found very dyspneic in the nursery and a congenital heart lesion suspected. In a one month old child abdominal pains and distention were the cause of admission to the hospital. On physical examination a pneumonia was discovered and routine treatment instituted, but the infant died 4 days after entrance. Post mortem showed both cases to be lung abscesses: the first congenital, the second post-pneumonic in origin. Three cases who died 3, 4 and 11 days, respectively, after admission were proven at autopsy to be multiple abscesses.

All of them were included in this class as one had been treated as a pneumonia, the other a decompensated heart, and the last as a septicemia following an extensive resection of the left mandible. A white male aged 46 died of a severe pulmonary hemorrhage less than 10 hours after admission. At post mortem the diagnosis of lung abscess was established.

Table 1—Distribution of Cases by Sex and Color

Sex		Improved	Same	Died	Total
White	—Male	37	7	29	73
	Female	5	2	3	10
Colored	—Male	7	1	6	14
	Female	2	..	2	4
Total		51	10	40	
Aggregate					101

Table 2—The Results of Various Types of Treatment

Treatment	Improved	Same	Died	Total	Mortality
1. General Medical	21	5	10	36	27.8%
2. Medical and Bronchoscopic	24	5	8	37	21.6%
Total 1 and 2	45	10	18	73	25.0%
3. Phrenicotomy	6	0	2	8	25.0%
4. Pneumothorax	0	0	1	1	100.0%
5. Thoracentesis	4	0	6	10	60.0%
6. Thoracoplasty	1	0	2	3	66.0%
7. Rib Resection (drainage tube)	3	0	4	7	57.0%
8. Lobectomy	0	0	1	1	100.0%
Total 3 to 8	14	0	16	30	53.4%

Table 3. Duration of treatment required by the different types, as judged by the total days spent in the hospital. The left-hand figure indicates the number of cases receiving that type of treatment, while the right-hand one the average length of hospital stay in days for the group. For example there were 21 cases who improved under general medical care, with an average stay of 29.5 days in the hospital.

	Improved		Same		Died	
1. General Medical	21	29.5	5	13.4	10	16.4
2. Bronchoscopic	24	54.5	5	37.8	8	55.2
Combined Medical	45	42.8	10	25.6	18	33.6
3. Phrenicotomy	6	30.1			2	31.5
4. Pneumothorax					1	4.0
5. Thoracentesis	4	14.5			6	10.3
6. Thoracoplasty	1	38.0			2	26.3
7. Rib Section	3	24.5			4	2.5
8. Lobectomy					1	4.0
Combined Surgical	14	25.0			16	12.2
9. Rejected—No B					6	5.7

SUMMARY

Cases of lung abscess are best treated by first considering the patient, then the abscess. All patients with non-tuberculous abscesses should have a high caloric vitamine full diet, sufficient fluids, plenty of fresh air, and an adequate postural drainage. A number of maneuvers and beds have been suggested to accomplish complete evacuation of pus from the cavity, but they seem to be of secondary importance. Drainage to be effective must be gravitational. This treatment is to be begun as soon as the diagnosis is made.

An ordinary "cold," pneumonia and oral operations are among the most common etiologic factors. Dullness to percussion, râles and decreased breath sounds constitute the earliest physical findings of a lung abscess. Those cases without a significant history and with uncertain physical signs can usually be diagnosed by weekly roentgenograms or bronchoscopic examination.

General medical care and good nursing such as could easily be given in the home of a patient will result in a very high percentage of cures. In this impartially selected group of 101 cases good medical care gave good results. Those cases in whom the diagnosis of lung abscess was made early and in whom treatment was begun at once had the shortest residence in the hospital and very favorable end-results. When this care was supplemented by bronchoscopic aspirations, better results followed. Delays in treatment, occasioned by uncertainty in diagnosis, decreased the incidence of cure by medical means, and favored the production of stiff walled chronic cavities. Thoracic surgery was done in about 30% of the cases, usually with less desirable consequences.

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BIBLIOGRAPHY

1. Cummings, G. O.: Treatment and Management of Non-tuberculous Pulmonary Abscess. Arch. Otolaryng., **19**: 684-9, 1934.

2. West, Samuel: Diseases of the Organs of Respiration. **I**: 363-6. J. B. Lippincott & Co., 1902.

3. Miller, J. A., and A. V. S. Lambert: The Treatment of Abscess of the Lung. Amer. Jour. Med. Sci., **171**: 81-93, 1926.

4. Pinchin, A. J. S. and H. V. Morlock: Abscesses of the Lung: Treatment and Diagnosis. Lancet, **2**: 842-6, 1930.

5. Spector, H.: Treatment of Bronchopulmonary Suppuration of Fusospirochetal Etiology with small doses of Neosalvarsan. J. Lab. & Clin. Med., **19**: 66-77, 1933.

6. Graves, R. J.: Remarkable and Unexpected Recovery from a Large Abscess of the Lungs. Dublin J. Med. Sc., **20**: 385-393, 1841.

7. Quincke, H.: Zur Behandlung der Bronchitis. Berl. klin. Wochenschr., **25**: 525-6, 1898.

8. Gerstley, J. R.: The New Era in Pediatrics. J.A.M.A., **76**: 1633-5, 1921.

9. Jump, H. D., and Frieda Baumann: Treatment of Lung Abscess. Med. Clin. N. A., **15**: 297-308, 1931.

10. Nelson, H. P.: Postural Drainage of the Lungs. Brit. Med. J., **2**: 251-5, 1934.

11. Lueth, H. C., and M. M. Scheef: Unpublished.
12. Marietta, S. U.: Treatment of Acute Pulmonary Abscess. J. A. M. A., 102: 1363-8, 1934.
13. Henderson, Yandell: Observations on Resuscitation from asphyxia and Prevention and Treatment of Secondary Pneumonia by Inhalation of CO_2. Brit. Med. J., 2: 687-9, 1931.
14. Jackson, Chevalier: The Mechanism of Physical Signs with Especial Reference to Foreign Bodies in the Bronchi. Amer. J. Med. Sci., 165: 313-20, 1923.
15. Jackson, C., and C. L. Jackson: Peroral Pulmonary Drainage. Amer. J. Med. Sci., 186: 849-54, 1933.
16. Lueth, H. C., and D. C. Sutton: Lung Abscess: A Clinical Consideration. (In press.)
17. Sante, L. R.: The Chest. Annals of Roent., 11: 259-66, 1930.
18. Funk, E. H.: Lung Abscess. Oxford Monographs on Diagnosis and Treatment, V: 220-7. Oxford Uni. Press. New York, 1929.
19. Miller, J. A.: Medical Aspects of Treatment of Abscess of the Lungs. N. Y. State Journ. Med., 27: 43-7, 1927.
20. Cherry, H. H.: The Rest Treatment of Non-Tuberculous Pulmonary Abscess. Amer. Rev. T. B., 25: 634-9, 1932.
21. Lilienthal, H.: From the Foreign Letters. J. A. M. A., 98: 2226-7, 1932, and J. A. M. A., 99: 243, 1932.
22. Harrington, S. W.: The Surgical Treatment of Bronchiectasis and Lung Abscess. Amer. Rev. T. B., 24: 612-25, 1931.
23. Jackson, Chevalier: Peroral Endoscopy and Laryngeal Surgery. Page 155-177. The Laryngoscope Company, 1915.
24. Miller, John: A Review of One Hundred Cases of Abscess of the Lung. Ann. Otol. Rhin. & Laryn, 40: 1198-1211, 1931.
25. Clerf, L. H.: The Bronchoscopic Treatment of Bronchiectasis and Lung Abscess. Amer. Rev. T. B., 24: 605-11, 1931.

DISCUSSION

Dr. F. M. Meixner, Peoria: I think Dr. Lueth's paper probably could cover much more ground if he had more time.

I think lung abscess is more frequent than we suspect, on account of the spontaneous cases that occur. I think that many cases diagnosed as influenza are probably misdiagnosed or are misleading on account of lack of chest findings when really they are small pulmonary abscesses. A treatise on treatment needs a word on prophylaxis. The time to treat these abscesses is before their appearance; 41% of these cases are due to a surgical procedure somewhere in the respiratory system. In infections of the upper tract, such as the teeth or gums, it is interesting that most abscess cases occur between the ages of forty and fifty. At that time you get middle age teeth trouble and tonsil trouble and sinus trouble, and I think there is a real relationship between these upper respiratory conditions and lung abscess. There is a definite lung finding in the hilus where the upper respiratory tract is subject to some lesion. If we remember to look in the upper respiratory tract for infection, we can use Dakin's solution or sodium perborate in order to help sterilize the tract or take care of the condition before subjecting the patient to surgery. We do not take out acute tonsils without proper preparation of the patient. During treatment, as Dr. Lueth has pointed out, the nourishment of the patient is very important. We formerly did not feed typhoid patients and they died from lack of food, but now we feed them. In these chronic infections the nourishment of the patient is perhaps the most important factor, and blood transfusions are very important to keep up the general strength. Vaccines are often thought of but may do no good in early cases and in late cases are probably of no value. Lipiodol has been used, but it is impossible to fill the cavity or irrigate it with any kind of solution.

In acute abscess there are two schools of thought: First, the surgeons who immediately think of bronchoscopic treatment; their theory is to open the abscess and get drainage. I think, following the theory of logic, you should treat it like any other surgical case; wait until a wall is formed around the abscess and then institute drainage. Incidentally, a diagnosis of the location of these abscesses, as Dr. Hedblom has said, is very hard to make. By means of fluoroscopy you can get a bilateral view in two planes so that you can put on a marker and take a picture and get a good localization of the abscess. This is necessary in order to know what position to put the patient in in order to get the best drainage. The location of the abscess will indicate as to the proper position for drainage and whether drainage will be satisfactory.

As to prognosis, in the early cases it is very good. In the abscess which has a hard, firm, fibrous wall and adherent pleura, I do not believe it is amenable to any form of treatment and that patient should be made as comfortable as possible and put on some kind of work where he may be happy and forget about the abscess. The gas gangrene type of abscess is fairly common. Serum, polyvalent or specific, is indicated in that type of abscess.

Dr. Lueth has given us a very good practical picture of this problem.

Dr. T. C. Galloway, Evanston: It is very gratifying to have Dr. Lueth's report since bronchoscopy in many of these cases was not undertaken with great optimism. This careful analysis shows very definitely that bronchoscopy is of considerable value in such patients. In any case bronchoscopic examination is of value as a diagnostic measure to rule out foreign body, mucus plugs and tumor.

I do not think the statement made in discussion is correct that one should not do early bronchoscopies. It is not a traumatizing procedure if gently done. By removing a plug or by aspiration one may get drainage before marked changes and get immediate restitution to normal. Bronchoscopy does seem of distinct value in removing plugs or thick secretion that the patient can not get rid of especially since the tussive squeeze brings these to the point where suction can remove them. Dilatation of a stenosed bronchus, occasionally irrigations and removal of granulations are bronchoscopic procedures that at times help much toward a cure.

Dr. Don C. Sutton, Chicago: The work of Dr. Lueth has been very painstakingly done. It points out clearly the fact that lung abscess can be taken care of in the home and that most lung abscesses are distinctly non-surgical.

THE SYMPTOMS AND DIAGNOSIS OF OBSCURE FEVER

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It is not easy to define just what we mean by "obscure fever." The word "obscure" is not used to describe the disease as insignificant, but to characterize the fever as not clearly comprehended; in other words, an "obscure fever" is one the cause of which has not been ascertained. The fever of sunstroke, pneumonia, protein shock, a thyrotoxic crisis, or of dinitrophenol, is due to the particular causative agent, which is obvious, not obscure. An "obscure fever" may be defined for the purposes of this discussion as a fever, the origin of which is unexplained.

This conception needs further qualification. Various reasons may exist for the failure to recognize the causation of a particular fever. This may be obscure because the particular form of infection responsible for the fever is an infrequent occurrence in the locality in which we meet it; for instance, few of us in our Northern States would quickly recognize a case of dengue. It may be that the course of a disease is atypical (as, for instance, is the case with chronic meningococcus septicemia which may run a fairly long course without the usual signs of meningitis, and is only determined by cultures from the blood). The nature of the infection may be obscure because of the short duration of the symptoms, or it may be obscure because, after weeks of observation, no characteristic symptoms, physical signs or laboratory results justify a diagnosis. It is with this group, continued fevers of undetermined origin, and the unrecognized cases of otherwise well known infections, that we will deal in this paper. Arbitrarily, only fevers of these two types, assumed to have been under careful observation, will be discussed here.

Another source of confusion arises from the frequent restriction of the terms "obscure fever" or "fevers of undetermined origin" exclusively to fevers which run a subfebrile course, a course characterized in the main by normal or nearly normal temperature, most of the time with rises perhaps to 100.5° once or twice a day. Lower maximum temperatures often occur. This discussion will include as "fevers of undetermined origin" the subfebrile type and those with higher temperatures, continued, remittent or intermittent.

It may be well to state briefly the definitions upon which this paper is based: "obscure fevers" are those in which the cause of the fever is undetermined;—this discussion pertains to fevers still "obscure" after two weeks of observation, whether the fever is slight or high, whether the symptoms are mild or severe.

One term must be defined, namely, fever. Wright accepts as the normal range of temperature 96.7° to 99° F. by mouth and 97.2° to 99.5° by rectum. He regards the rectal temperature as more reliable. Grafe apparently voices German opinion in his statement that the mouth is much more rarely used for the determination of the temperature than the rectum or the axilla. He regards the rectal temperature as most satisfactory, rejects the axillary method altogether and questions the accuracy of a temperature record obtained in the mouth. He accepts the normal rectal temperature as 99.5° F. Kintner and Rowntree, in a paper on "Long Continued, Low Grade, Idiopathic Fever" say, "We are of the opinion that in the adult a continuous mouth temperature of 99° or above represents fever, whether or not the patient is nervous. Furthermore, we feel that it is wiser to investigate patients with continuous low grade fever than it is to ignore the temperature or to explain it away." As a practical working basis this statement is satisfactory. A temperature of 99° F. by mouth may be accepted as evidence of fever and will be so regarded throughout this paper. Yet, as a significant comment upon the inevitable relativity of much that is here said, it may be added that most of us tacitly ignored mouth temperatures of 99.5° for instance, on several days last summer.

Yet one more "ghost must be laid"; if not finally, it may be considered and hereafter ignored. We know that exercise, excessive in character, will produce fever. It is also well known that in such diseases as tuberculosis and the late stages of typhoid, also during convalescence, there is a pronounced lability of body temperature. Discussion may be found in the literature as to the value of determinations of the temperature about the menstrual period and

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after exercise, as providing results which are useful in the diagnosis of tuberculosis. As the result of these and similar experiences there is much interest in the question as to the existence of nervous or psychogenic fever.

In a recent paper from Grafe, reference is made to the prevalent skepticism about purely nervous or psychogenic fever: he says, "Eichelberg first brought convincing proof, since he not only definitely proved clinically the presence of fever in hysteria, but also showed that this fever could be caused to recede by hypnotic methods and then reproduced even to a height of 39° C. (102° F.). These results have been confirmed by other investigators, one of whom (F. Deutsch) found it so frequently that he is inclined to differentiate an organic and a psychogenic factor in fever." The danger inherent in the acceptance of such an explanation for fever is forcefully expressed by Kintner and Rowntree: ". . . While it is true as will be shown, that a long-continued low grade fever is associated frequently with stigmas of neurosis, it will likewise be demonstrated that the fever persisted in still more individuals in whom no neurogenic basis could be found. It is obvious, of course, that the labeling of such fever as of neurogenic or psychogenic origin accomplishes nothing for either the patient or the physician, and serves on the other hand as a block to investigation and progress."

Practical and sensible as this statement from Kintner and Rowntree is, there still lingers some doubt as to its final validity, if we interpret it as disposing of the question of nervous fever. We know, for instance, that during convalescence from tuberculosis and typhoid there is a sensitiveness of heat regulation to both physical and emotional factors; undue exercise or an emotional upset, sometimes petty, are often followed by a rise of temperature. If the heat mechanism, hypersensitive because of a recent infection, may respond to an emotional upset with a rise of the temperature above normal, is it not conceivable that in certain persons with unstable nervous systems a similar rise of temperature might occur at periods of definite increase of the particular individual's response to nervous stimuli? In the last five years many cases of "obscure fever" have come under my observation. Many of these, the larger proportion, indeed, have occurred in young women. Statistics from our own work would be worthless, because nurses in training have made up a disproportionate number of the patients able to stay in the hospital through a long course of fever, yet the frequency of "obscure fever" in young women, often of nervous temperament, has been thought-provoking. Kintner and Rowntree report that two-thirds of the one hundred patients in their series were in the age group between 20 and 40 years, "whereas 38 per cent. of the clientele of the clinic fall between these ages. . . . Females constitute almost three-fourths of the entire group, 72 per cent. This is also out of keeping with the sex ratio of the clinic clientele, in which women present 54 per cent. In our opinion the relationship of a primarily hypersensitive nervous system to the development of the subfebrile type of obscure fever is a timely subject for study.

Leschke classifies the causes of fever thus:

"(a) Physical changes of the surroundings (overheating, interference with heat dissipation).

(b) Nervous stimulation of the heat center (the tuber cinereum and hypothalamic region).

(c) Chemical or physico-chemical substances, among which we can differentiate:

1. Substances which arise from the destruction of the body cells (aseptic and resorption fever).
2. Simple chemically constituted substances (sodium chloride, colloidal suspensions, protein split-products). (To this group we may add dinitrophenol).
3. Substances which arise from pathogenic microorganisms in an infected body."

While it is with the fever of infection that this paper is particularly concerned, it is not feasible to ignore other causes. One group includes the obscure fever which may occur in the course of advanced carcinoma, the purpuras, pernicious anemia, and the leukemias—diseases which cause destruction of the body cells or produce protein split-products. Banti's disease and Hodgkin's disease may provisionally be classified as developing fever due to infection. The fever of hyperthyroidism is probably due to increased heat production with relative "interference with

heat dissipation." While serum reactions with fever of short duration are well known, the contention of Rowe that "food sensitization may be responsible for intermittent or prolonged elevation of temperature" has not found general acceptance.

In fever the cardiac rate is increased, usually, but not invariably, in proportion to the height of the fever. The respiratory movements are increased in rate and depth. The metabolism is increased, upon the average, about 25 per cent. Protein metabolism is disproportionately increased, up to 50 to 140 per cent. Increased nitrogen excretion begins in the prodromal stage. The patient is undernourished and loses weight due to the rapid exhaustion of the glycogen and the impossibility of administering sufficiently rich nourishment to compensate for the increased metabolism in patients with fever and a poor appetite. High fever implies severe injury to the protein substances of the body, the effect of which can outlast the subsidence of the fever. The urine contains an increased amount of ammonia, creatinin and uric acid.

The digestive disturbances are numerous: dry, coated or fissured tongue, loss of appetite, diminished secretion of all the digestive glands, salivary, gastric, pancreatic and intestinal. The urine is diminished in quantity and is highly colored; the specific gravity is increased; febrile albuminuria is common. The number of blood platelets is usually increased. The leukocyte count is increased in many diseases but there are certain notable and well known exceptions. Anemia is not common except in severe or prolonged infections. The sedimentation rate of the red corpuscles is accelerated. The nervous symptoms vary from the headache of minor infections to the notable delirium of the patient with typhoid or the significant manifestations of central nervous disease seen in encephalitis and meningitis.

In keeping with our earlier observations, the symptoms of fever of undetermined origin may be presented under two headings:

1. The subfebrile, long-continued fever of unknown origin which is likely to run a prolonged course without at any time presenting features, symptomatic, clinical or laboratory, which warrant a definite diagnosis. This group is so characteristic that there might have been justification for confining our discussion to this type of "obscure fever."

2. The definite, well-developed fever, continuous, remittent, or intermittent, often high, with associated symptoms of variable severity; the picture is that of a serious infection. In this group, careful study usually results in accurate diagnosis, but not always. Unless there is opportunity for roentgenologic study miliary tuberculosis may not be discovered: periarteritis nodusa is rarely diagnosed during life; clinically it presents a cryptogenetic sepsis. Chronic meningococcic septicemia may run a long course before it manifests its true nature by meningeal symptoms or is revealed by a positive culture from the blood. On the other hand, some obscure fevers of this group are becoming less obscure as more thought of them is taken; undulant fever and tularemia are no longer overlooked as obscure fevers for weeks. Such conditions as actinomycosis, leptothrix and streptothrix infections and rat-bite fever are still "obscure" to most of us, because we forget them. A discussion of "obscure fevers" must include the subfebrile group and the group of high fevers with more prominent symptoms.

The symptoms of the mild or subfebrile type are not marked. Often these are related to an ordinary "cold" or sore throat, perhaps a bronchitis, subsequent to which the patient improves from the more acute symptoms yet fails to regain former good health. A moderate or slight cough may persist. A prominent symptom is a lack of the patient's usual vigor; there is a disinclination to exertion, mental or physical, the patient tires easily and complains of a constant sense of fatigue. The appetite may be impaired but often the patient will eat well, particularly after a few days' rest in bed has relieved the constant weariness. A mild headache may be present. Mild insomnia is fairly frequent. Constipation is common; diarrhea so uncommon that its presence calls for special attention. Vague muscular pains are often present. Joint pains suggest that the infection is rheumatic. The urine may show a trace of albumin. A moderate leukocytosis, 10,000 to 15,000, is often present, although the leukocyte count is not infrequently within normal range. An anemia is apt to be present if the fever has existed for some time.

A systolic murmur at the base of the heart is common; this type of fever is common in young women in whom such murmurs are frequently found in health. The presence of a systolic murmur at the apex or over the precordium, especially if this develops under observation and is associated with a definite accentuation of the second pulmonic sound, supports the diagnosis of mitral endocarditis. Occasionally there are tender cervical glands.

During the past three years, eight nurses in training at the Evanston Hospital have been under observation at the hospital because of persistent fever, through single periods varying from 36 to 109 days; the average duration of hospital residence was 65 days. In one case a diagnosis of recurrent acute endocarditis was accepted. The other patients were discharged with the diagnosis of "fever of undetermined origin." The temperature at entrance varied from 100° to 100.4°. Malaise, headache, anorexia, general muscular aching, slight cough, were the common complaints. The leukocyte counts varied from 5,500 to 16,000. One patient had an initial influenza during an epidemic, one had pain almost suggestive of a left pyelitis, which was not confirmed, and one had pain in the left chest without physical findings, for one day. Urine examinations were numerous; occasionally a faint trace of albumin was found; in no case did the findings warrant the diagnosis of infection of the urinary tract. Significant anemia was not discovered; in one case, one count of two showed a red count of 3,960,000; in the group, many other counts varied from 4,050,000 to 4,900,000. One patient was allowed to leave the hospital while still febrile; the others were afebrile from ten to twenty-four days before discharge. Within two years, one of the patients in this group was a patient in the hospital five times; three were patients four times each, and one three times. One patient, upon the basis of changes in the electrocardiogram, was regarded as having an acute myocarditis. While we believe that our evidence justified this diagnosis, the relationship of myocarditis to fever is not sufficiently shown to warrant us in dogmatically offering thus to explain the fever in this case.

One case from this group may be cited as illustrative: A young woman of 20, a nurse in training, was admitted to the hospital with fever and general malaise of four days' duration. She had noticed a slight cough for two months; this was associated with a steady pain over the left lower chest anteriorly, which was aggravated by deep breathing and lying on her side. She has always had severe constipation and has been subject to attacks of migraine. She had scarlet fever at 7, and had rheumatism of the left wrist within the same year. Tonsillectomy was done, and she had no further rheumatism; she was also relieved of sore throats. At 15, she had two attacks of influenza, three or four months apart, associated with general malaise, fever, cough and night sweats. Upon admission the blood pressure was 135/80. A systolic murmur was heard at the base of the heart. The urine was negative. The blood count was normal. The sedimentation time was normal. Throat cultures were negative for streptococci. Blood cultures for the typhoid and melitensis groups were negative. Roentgenological study of the chest, sinuses and gastrointestinal tract was negative. The electrocardiogram was normal; the rate was 100. Pelvic examination was negative. Ears, nose and throat showed no evidence of disease. The Wassermann was negative. The Mantoux test was negative. For a few days she had some migratory pains in the elbows and wrists. X-ray films of the teeth were normal. An intravenous urogram was negative. During her stay of ten weeks in the hospital her temperature was occasionally normal, but never for more than two days in succession. After her discharge she stayed at home for two months; the temperature curve remained the same. After six months she returned to work, but the temperature, though somewhat lower, was still slightly above normal almost every day. Finally she gave up her work. This patient offered, upon the basis of her history, the possibilities of cardiac and pulmonary disease, but a diagnosis of disease of either heart or lungs is not admissible. Some of the more technical diagnostic procedures noted were employed because of specific complaints on the part of the patient.

In addition, may we cite two cases from private practice: A woman, now 45, was known twelve years ago to have mitral regurgitation and hypertension. She also had frequent attacks of tonsillitis. Since 1927 she has had a daily rise of temperature to 99.4° or 99.6°, almost constantly, although she was kept in bed over three long periods, for more than two years. In 1930 she developed gallstone colic for which she submitted to operation, principally because she hoped that the removal of the gallbladder would free her of the fever. She is relieved of the pain due to gallstones but the fever persists. In 1928, 1929, and 1930, repeated blood cultures were negative. She has never had petechiae nor emboli; there has been no extension of the cardiac disease to other valves. In spite of eight years of almost constant fever, the evidences of mitral endocarditis are no more significant now than they were in 1923. Is it permissible to attribute her mild infection as shown by continual fever and a moderate leukocytosis to a simple acute endocarditis of at least eight years' standing?

In January of 1933, a young woman was seen who complained of malaise and general ill-feeling; she knew

that she had an afternoon rise of temperature up to 99.6° or 99.8°. She complained of pain in the chest, but had no cough. In the office her temperature was normal, the hemoglobin 92 per cent. erythrocytes 4,520,000, and leukocytes 6,000. The urine was normal. Physical examination was entirely negative. Some ten years previously she had had a pyelitis but this had cleared up promptly. No remission occurred. Stereoscopic plate of the chest was negative. She was kept in bed under observation for some time. Five months later she was seen at another hospital and here urological examination was done. The urinary tract was normal. The examination revealed no evidence of disease. Blood culture was negative. Blood counts again were normal. She was discharged with a diagnosis of "post-infectious debility." She continued to have fever for about a year in all. No diagnosis was made. She has now been free of fever for more than a year. This case of "obscure fever" was undiagnosed.

Kintner and Rowntree found that the patients in their series of 100 cases of "long-continued, low-grade, idiopathic fever" varied in age from 15 to 69. Females made up 72% of the group. In 65% of the patients, despite the prolonged fever, the patients looked healthy. Fever was known to have existed from one month to eleven years prior to registration. After discharge, the fever subsided in one month to six years, in 55 cases; 38 patients continue to have fever and 7 are dead. Of the total group, 87% complained of exhaustion, 50% of nervousness, and 38% of loss of weight; these were the three most common symptoms. "Tuberculosis had been diagnosed in 26 instances. In no case had the bacillus of tuberculosis been demonstrated. Four of the group had had diagnoses of Hodgkin's disease, gallbladder disease, salpingitis, and Addison's disease, none of which were confirmed here or elsewhere. Fourteen others had various unconfirmed diagnoses, while twenty-one had previously been told that no cause for the fever was apparent." Removal of foci of infection was advised in 35 cases and followed out in all. Fever subsided in 60% of these. In the 50 cases in which no foci were found or removed, the fever subsided spontaneously in 59%. There was no difference in the subsidence of fever in the two groups.

Alt and Barker reported upon "the subsequent course of 173 patients discharged from the Peter Bent Brigham Hospital with a diagnosis of fever of unknown origin." This group included patients who were discharged "after painstaking clinical and bacteriological investigation" had failed to justify a diagnosis. Queries were answered by 101 of this group of 173; 42 had fever of less than ten days' duration. Of the 59 who had fever of more than ten days' duration, 18 had been discharged from the hospital, afebrile; of these, after some years, 15 were well. Of 18 who were discharged while still having fever after ten weeks, two had continuation of fever and five had died, six weeks to four years after discharge. There were 23 in whom an ultimate diagnosis was established; 6 eventually developed demonstrable tuberculosis, 4 developed definite signs of chronic rheumatic fever; 3 died of carcinoma (all within three years); 2 died of lymphoblastoma; 1 died after thyroidectomy; 1 died after appendectomy. One continued to have occasional chills with fever for six years, which stopped after the discovery of a positive Wassermann test was followed by appropriate treatment. The last case was that of a woman with a breast abscess which was still draining; her fever stopped after she was given quinine for a malaria which was long overlooked.

It has been pointed out that the term "obscure fever" includes another type of case, characterized by higher temperatures and more serious symptoms, which, in most cases, eventually develop in such a way that accurate diagnosis is possible. A case in point is that of a woman of 42 who was recently admitted to the Evanston Hospital after two weeks' illness at home. The history was brief: she was taken suddenly ill with severe pain high in the epigastrium shortly after she had eaten a late and perhaps injudicious meal. Thereafter the pain persisted and was associated with tenderness and moderate rigidity to the left of the midline in the small area between the midline and the costal margin, a little below the ensiform. The appetite was good, the bowels regular, there was no vomiting. The chest was negative; this was confirmed by two sets of x-ray plates; no evidence was found of involvement of the heart, lungs, thoracic glands or thoracic cage. One finding of importance, and only one, appeared upon roentgenological examination—there was some impairment of the movement of the left diaphragm toward the midline. The temperature ranged from 99° to 100°. There was a persistent leukocytosis, as high as 21,000. Otherwise there were neither symptoms nor signs of disease. The patient improved slowly but demonstrably for about ten days; the tenderness and pain were much less marked, the fever subsided to a daily high level of 99.6°, the leukocyte count was below 15,000, once as low as 9,600. Then for no apparent cause the symptoms were aggravated, the pain and tenderness significantly worse, the temperature rose to 102°, the leukocytosis was again over 20,000. Almost five weeks after the initial pain, the abdomen was opened for an exploratory procedure, the general impression about the diagnosis being that a perigastric abscess following the rupture of a silent ulcer near the opening of the esophagus would be found. A solitary abscess in the left lobe of the liver was opened and drained. The patient had been singularly free from bowel disturbances; there was no history suggestive of dysentery. The pus was not like that from an amebic abscess. Amebae were not found prior to the operation in the stools; after the operation the stools were free of amebae; none were found in the pus.

It is cases of this type that make up a large part of the cases of "obscure fever" with well-defined symptoms of infection. All of us have wrestled with instances of "cryptogenic sepsis" sometimes for weeks; not infrequently has the diagnosis been revealed, for the first time, at autopsy. I recall a case of sepsis in a physician

following a crop of boils; at least a month passed before this fever of undetermined origin was found to be dependent upon a perinephritic abscess. In another physician, an older man with a rheumatic heart disease of twenty years standing, there was persistent fever following a suppurative inflammation of the left ankle. The latter was drained and was practically healed; for six weeks we were unable to determine the diagnosis; then the symptoms of an acute inflammatory process within the abdomen indicated operation, which revealed a mesenteric thrombosis. The diagnosis of recurrent endocarditis with thrombo-ulcerative processes was confirmed anatomically.

Sepsis of various types is responsible for many fevers of undetermined origin. This may be localized, sub-diaphragmatic, hepatic, perinephritis, or intraabdominal abscesses elsewhere may be responsible for septic fever. All of us have followed some such cases through trying experiences. Twice, osteomyelitis of the spine, with local abscess formation, has come under my observation: once this was diagnosed clinically; in the second case the clinical diagnosis referred the disease to the kidney. Multiple small abscesses of the lung, primary after a severe pneumonia, especially of the type known as streptococcic bronchopneumonia, or secondary to a focus elewhere, may be overlooked. Periarteritis nodosa is a general sepsis which thus far has been correctly diagnosed during life infrequently. A purulent pericarditis may follow a pulmonary infection, pneumococcic or streptococcic, and cause great difficulty in diagnosis, especially if opportunities for radiological studies are not present. Chronic meningococcus septicemia has been mentioned.

A second group of obscure fevers with high temperature and courses of severe type is obscure because the disease is not sufficiently well known, or the physician fails to think of it. Undulant fever, a novelty to all of us only six or seven years ago, is easily diagnosed if we think of it and employ specific serological tests. Tularemia is recognized much more frequently than was the case ten years ago. Rat-bite fever, infrequent as it is in this part of the world, ought to be easily recognized if it is only kept in mind. Miliary tuberculosis is too often forgotten as a possible diagnosis. Even malaria fails of recognition now and then because of our failure to examine the blood. Typhoid of unusual course may be deceptive. The diagnosis of hepatic suppuration is notoriously difficult.

The task of diagnosis is to describe the anatomical changes underlying the fever of undetermined origin and to discover the infection or other causative factor which has been responsible for the pathologic processes. Often enough, only one of these implied questions is answerable. If we discover fever associated with leukemia or Hodgkin's disease or advanced carcinoma, we are content to explain the fever upon the anatomical basis; we accept the obvious disease as the explanation for the fever, since we are ignorant of the etiological factors behind the diseases mentioned. If, in the course of an unexplained fever, we find a positive serological test for typhoid, and demonstrate typhoid bacilli in the stools or urine, we are content with such anatomical evidence of typhoid as the low leukocyte count and a palpable spleen. The clinical course of a fever like a mild typhoid, without positive serological reactions, suggests undulant fever; serological and bacteriological study will confirm the diagnosis. In rheumatic endocarditis, on the other hand, the bacteriological evidence is subordinate to the clinical. The development of a characteristic murmur in the course of the fever, the occasional arthritis, perhaps only involving one or two joints, the history of susceptibility to acute tonsillitis, permit a diagnosis, if not certain, at least highly probable. Tuberculosis presents a similar problem: the anatomical changes revealed by physical examination and the x-ray are not diagnostic of active tuberculosis; loss of weight and strength are not diagnostic; even the presence of tubercle bacilli in the sputum is not conclusive proof of active tuberculosis. The diagnosis of acute endocarditis or of active tuberculosis is largely dependent upon the presence of fever such as we have herein discussed in association with other findings. Many forms of localized sepsis present the problem of discovering a localized infection amenable to surgical treatment. Blood cultures, serological tests and leukocyte counts, the height and type of the fever, the secondary symptoms, chills, sweats, tachycardia and albuminuria, may

reveal the type of the infection and its manifestations, but the disease remains "obscure" "undetermined" until the situation of the infection is discovered.

Toward this practical end, the attainment of a correct diagnosis, our efforts must be turned. Whatever means are at our disposal should be used, as indicated. It is not advisable to subject these patients to a medley of procedures in an irresponsible way, yet we should add to the routine complete examination, other diagnostic procedures as they are indicated. No reasonable method of examination should be omitted, yet it may be said, with even greater emphasis, it is better to take some things for granted than to so harass and upset a patient as to promote fever through pain and fear.

The common cause of "obscure fever" are tuberculosis and sepsis; the sepsis may be due to any of the organisms known to produce inflammatory processes. Tuberculosis as the cause of such fever may be active in the lungs, lymphatic glands, intestinal tract, serous membranes, genitals or the kidneys. Acute endocarditis and pyelitis are the most common manifestations of non-specific forms of sepsis, but sepsis of this type may be found localized in various situations within the body, or generalized, without a demonstrable local focus, in the blood. And various conditions other than sepsis or tuberculosis, already mentioned, may cause fever of undetermined origin through weeks and months.

It is not acceptable to attribute fevers of this sort to some old focus of infection, quiescent in character. Ascription of the symptoms to such a focus is more likely to mislead them to clarify; a false sense of security as to diagnosis may lead to disregard of important developments in the course of the disease. The removal of so-called foci of infection under the conditions herein described is unlikely to serve a useful purpose. The procedure may be responsible for aggravation of the disease; it is of questionable service at the best; at the worst, it may make the patient significantly worse.

It does appear that the age of the patient is of importance in the determination of the diagnosis. In older people the cause of the fever is more likely to be discovered; in the young, especially in young adults, subfebrile fever is most common and most likely to remain obscure. The prognosis is better in the young group; here the ultimate disclosure of serious disease is unlikely. A similar course of fever in older individuals demands greater reserve about the prognosis.

Finally, the diagnosis must be adequate. It must answer the principal problems of the particular case, without presenting other unsolved problems, or taking too much for granted. Even with complete examinations we may be tempted to error through false leads, following which a diagnosis is made, accepted and henceforth retained, upon insufficient evidence. Diagnosis should be reserved for the support of convincing evidence. Until such evidence is at hand, we need to avoid final conclusions. For all of us, once a diagnosis is made, are in danger of closing our minds. In the presence of some definite finding we may err in attributing final importance to some fact which we can grasp. In the last analysis, the diagnosis of "obscure fever" requires good clinical judgment, and for many of the cases here described, especially of the subfebrile group, the diagnosis of "obscure fever" must be accepted as the final description.

DISCUSSION

Dr. Frank Deneen, Bloomington: Dr. Carr's paper shows a lot of intensive study of types of cases which so frequently give us no results whatever. I think the best way to approach any case of fever is with the idea that you don't know what it is, and then gradually work out the case and see if you can't reach a conclusion. Dr. Carr has taken the stand that at least two weeks' observation of temperature above 99 is necessary before the fever can be included in this group.

He spoke of the psychogenic type. I recently had a man, whom I had studied for several years previous on different occasions, in which he ran an intermittent temperature. When it goes up I put him to bed and the temperature remains normal and he feels good. He gets back up again and his temperature is around 99 and a fraction. He says his skin feels hot, that he is weak and it makes him very nervous. I put him back to bed and the temperature returns to normal.

Last year I had three cases of Rocky Mountain fever. Apparently the Public Health Service does not quite agree with the classification of these fevers. One of them looked like a typical Rocky Mountain type; the other two, what some men call the Eastern spotted fever. But, in corresponding with the health department in Hamilton, Montana, Dr. Parker stated that he thought all three were Rocky Mountain fever. The first case didn't develop the eruptions for almost three weeks after the development of the temperature. The other two in the course of a few days developed the typical centripetal eruption.

One thing we must remember about malaria. Any time a patient has had malaria, as in other types of

protozoan infestation, they remain latent over long periods of time. These recurrent cases years after the initial attacks do not run a typical course. The recognition of the plasmodium in the stained specimen or the fresh specimen of the blood is very difficult, but your quinine is a specific and should be given. The patient is entitled to that.

There are often times in which the physical findings are all negative except tenderness over the gall bladder. Sometimes the tenderness is more easily found in the upright position. I think these cases are entitled to the benefit of the doubt that the gallbladder might be the causative factor and should be given the dye and medical drainage. This procedure will clear up a large number of cases of obscure fever.

In sinus conditions we should not accept the report of the nose and throat man that there is nothing in the sinus but every one of them should have an x-ray picture. I think you will find frequently pus collections in the antrum, without associated pain or tenderness.

Undulant fever, of course, has been touched upon by men who know so much more about it than I do, but I will state that in a couple of cases the agglutination test did not come back positive with every specimen sent. The fact that you do not get a positive report on your blood where you suspect undulant fever, does not mean anything, and so do not hesitate to have that repeated several times.

I want to say that I enjoyed all the papers in this symposium and believe they should stimulate all of us to continue the study of these unknown fevers.

EPIDEMIOLOGY OF OBSCURE FEVERS

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A discussion of the epidemiology of fevers, or of obscure fevers, to which the subject has now been limited, at once harks back to the diagnosis of the cause of the condition. It would be futile to consider the epidemiology of fevers, or attempt to take preventive measures against their spread without determining their specific cause.

Nevertheless, the existence of fever of obscure origin in a series or group of similar cases in any locality immediately presents an epidemiologic problem.

Fever in common types of infection: In extensive local outbreaks of measles, whooping cough or typhoid fever, the early recognition of fever in the development of new cases of these diseases is of distinct value in their epidemiologic control.

Epidemiologic experience shows that measles infection cannot be prevented in schools, if developing cases of the disease are not excluded, until the Koplik spots are observed.

If new cases are to be excluded in their earliest stage of infectivity, then this must be done when they present the first evidences of fever. This often antedates the appearance of the Koplik spots from 24 to 36 hours.

During an epidemic of measles in Springfield, Illinois, in the spring of 1934, in which 1,450 cases of the disease occurred among approximately 12,000 elementary school children, all children with catarrhal symptoms and/or fever were excluded from the schools in which the disease was prevalent. A total of 192 children were thus excluded on account of fever and the majority of these developed measles outside of the school room.

Similarly, the early recognition of fever will aid in suspecting cases of whooping cough and typhoid fever in outbreaks of these diseases.

Epidemiology of less common fevers: Under this heading attention must be given especially to undulant fever and tularemia on account of the widespread sources of infection, in this country, for these maladies.

Undulant Fever: The following well established facts in regard to the etiology of undulant fever are important in the epidemiology of this disease.

1. The disease, now known generically as Brucellosis in man and animals is caused by at least one of three varieties of the Brucella group of organisms. The melitensis variety (Bruce 1887) is the cause of the disease in goats, the abortus variety (Bang 1897) is most commonly the cause in cattle and the suis variety (Traum 1914) in swine. Interchangeability of hosts occurs with all varieties of the organism.

Other animals such as the horse, mule, sheep, dog, cat, rabbit, guinea pig and rat are susceptible to infection. The infection has also been produced in poultry.

Man is suspectible to infection by any of these three, but least to the abortus or bovine variety.

2. Brucellosis is widespread in cattle and hogs in this country. Recent statistical summaries made by Starr[1] and Giltner[2] show the occurrence of Brucella agglutinins in the sera of cattle in various states of the U. S. ranging from

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10 to 90%. Cotton[3] says that the proportion of infected herds in some localities may exceed 50% and the number of reacting cattle in such herds may average about 20%. Starr[4] in summarizing the investigations made to determine Brucella agglutinin reactions in swine, in various parts of the U. S. and Canada, found from 10 to 20%, while in significant titers of 1 to 100 or over, the percentage ranged from 1 to 3%. The highest percentages were found in the Middle West and notably in Iowa as reported by Hardy and Associates[5]. They found 18% of 611 hogs tested positive and 16% doubtful (66% negative).

In the U. S. Brucellosis of caprine origin has occurred as a result of the importation of infected goats. It is a potential menace in the southwestern states, along the Rio Grande. Watkins and Lake[6] found 19% of 115 goats in Phoenix, Arizona, positive reactors to the agglutination test and responsible for 5 human cases of Malta fever in that city in 1922.

At the present time the goat is not considered a serious reservoir of the disease in this country.

3. Animals may harbor the infection without showing any symptoms of the disease. This is especially true of goats. In cattle the disease manifests itself as infectious abortion. The general health of cattle found suffering from this disease is usually not impaired and death seldom results. In addition to the loss of calves there may be impairment of milk flow, associated with disease of the udder. The manifestation of the disease in hogs is similar to that in cattle.

4. The Brucella group of organisms has an affinity for the uterus, embryonic tissues and the udder. The organism occurs in the uterine discharges in large numbers at the time of abortion. Aborted fetuses and placental tissues are a common source of infection for swine.

The udder and regional lymph glands are usually involved in the infection and the organisms appear regularly in the milk.

5. The infection in man and animals is readily recognized by means of the agglutination test. Most observers do not consider this test significant unless it occurs in titers of 1:100 or greater.

6. The fact that the Brucella group of organisms are readily killed by the temperatures required to be employed in the pasteurization of milk is of great epidemiologic importance.

7. Interhuman transmission of undulant fever is a negligible factor in the spread of the disease.

8. The common source of infection in humans is raw milk from infected animals. Infection with the porcine variety usually occurs through cutaneous abrasions.

9. The period of incubation in man is from two to three weeks. Laboratory and experimental infections occur in shorter time, usually in from 5 to 7 days, probably on account of more massive infection.

The occurrence of a case or a series of clinical cases of undulant fever verified by serological tests warrants the following epidemiologic investigations:

1. The extent of the outbreak: An isolated case always presents difficult problems in tracing the source of the infection, especially when exposed to several chances of infection. Thorough investigations of the sources of infection can only be made if all the cases of the disease in the community are found and recognized.

2. Classes of persons involved: Classes is here used in a broad sense and includes classifications as to age, sex, color, occupation and any others that may have a bearing in a given community.

3. Residence: This is very important in the investigation of isolated cases in view of the fact that the infection may have occurred elsewhere in non-residents, travelers or vacationists.

4. Food and milk supply: In this connection, the occasional sources of supply, including restaurants, should not be overlooked. Where it is claimed that only pasteurized milk has been consumed, it may be well to check on the efficiency of the pasteurizing plant from which the milk was obtained and also the possibility of infection from other unpasteurized dairy products.

5. Contact with human carriers: This is not an important factor according to our present knowledge of the transmission of the disease.

6. Reservoirs of infection: Due to work of the states, the U. S. Bureau of Animal Industry and the U. S. Livestock Sanitary Association, the presence of Brucella infection in cattle, swine and goats in the various localities in the United States is being definitely established. (Dr. John J. McShane, Chief of the Division of Communicable Disease of the State Department of Health,

in his discussion of this series of papers will present figures in regard to the prevalence of this disease in Illinois.)

In considering the animal reservoirs of infection, the fact that certain herds are certified as free from infection and that efficient pasteurization destroys the various types of Brucella organisms must be kept in mind.

There is another factor in the epidemiology of undulant fever, in regard to which there has been much difference of opinion. That is the susceptibility of man to infection with the bovine variety of the Brucella group of organisms.

When one considers the great reservoir of infection for this type of Brucellosis, namely, 20% of the cattle in 50% of the dairy herds and contrasts it with the relatively small number of cases of undulant fever reported to the U. S. Public Service annually, 1,659 in 1933, it is evident that man is either not very susceptible to this type of infection or else that the infection is not generally recognized.

There are no data available showing the source or manner of infection of the sum total of cases reported annually. From a general knowledge of the factors, as determined by numerous local intensive surveys, it may be assumed that this total number of cases, includes a certain proportion due to the porcine variety of Brucella infection and that in addition to milk infected cases, there were contact infections such as have been observed in veterinarians, butchers, abatoir workers, stock raisers and farmers.

In the Iowa series of cases reported by Hardy and Associates,[7] 209 showed contact with livestock or carcasses and 125 no such contact.

Another fact, that has been generally observed which may be considered as evidence against great susceptibility of milk infection is the preponderance of adults over children in undulant fever cases reported in view of the fact that children are the greatest consumers of milk. This observation may not be as important as it seems for Brucellosis in animals is essentially an affliction occurring during their period of maturity. The same is apparently true in regard to man.

Starr,[8] after reviewing all of the literature on the subject of human susceptibility to milk infection with Brucella organisms and citing instance after instance where this was proved without a question of doubt, shows definitely that such infections are found wherever carefully investigated.

From an observation of 70 cases in his own State of Virginia he concludes "that undulant fever in man is not statistically impressive as a medical or public health problem. On the other hand, viewed from the standpoint of the individual who has suffered from the disease and who has been incapacitated for weeks or even months, the disease is of great importance." This conclusion may well be applied generally.

Tularemia: The following facts regarding the etiology of tularemia are of epidemiologic importance:

1. Tularemia is an infectious disease caused by the bacterium tularense (McCoy, 1911).

2. Primarily it occurs as a fatal bacteremia of wild rodents, especially rabbits and hares. It has also been found in ground squirrels, woodchucks, opossums, muskrats, coyotes, wild rats and mice. When such animals are found sick or dead in the fields in areas where the disease is known to be prevalent, they should be considered as potential sources of infection.

3. Domestic rabbits, raised in rabbitries, have not been found naturally infected.

4. Guinea pigs are readily inoculated. This procedure can be used as a means for obtaining pure cultures of the causative organism.

5. Blood sucking insects, such as lice, flies and ticks are believed to transmit the infection from rabbit to rabbit in nature and are known to be capable of conveying the disease to man.

6. The most common modes of infection in man are through abrasions on the hands or introduction of infected material into the conjunctival sac. Dogs and cats may carry the contamination on their mouths.

7. Instances of infection from man to man are extremely rare.

8. The period of incubation in man varies from about two to twenty-one days and averages about four days.

9. The blood serum from a case of the disease in man or animals gives a characteristic agglutination test.

In the epidemiologic investigation of cases or outbreaks of tularemia the general procedure should be practically the same as outlined for undulant fever, except that other probable sources and modes of infection would have to be considered.

McShane[9] in his discussion of this series of papers will report the sources of infection in the clinical types of the disease. His observations are based on the following number of cases:

1. Ulceroglandular type—384 cases.
2. Oculoglandular type—7 cases.
3. Typhoid type—11 cases.

Malaria: In concluding the discussion of the epidemiology of the obscure fever, a few words must be said about malaria. Until 1878, Malta fever went under the name of remittent malarial fever. There are certain similarities in the fever manifested by these two diseases. This makes it imperative that a laboratory diagnosis be made and the disease specifically recognized before epidemiological investigations are inaugurated in febrile conditions of this kind.

Fever in other communicable diseases: While fever is a more or less constant symptom even in the early stages of such diseases as epidemic cerebrospinal meningitis, epidemic meningitis and acute anterior-poliomyelitis, it *per se* has no significance in the epidemiologic investigation of these diseases. These diseases, unlike measles, never occur in sufficient numbers at a given time, in a community, so that fever, unaccompanied by other pathognomonic signs and symptoms can be utilized in suspecting such infections.

In tuberculosis of the open types, afternoon fever on successive days serves epidemiologically as a sign of activity and infectivity. The significance of this, in the spread of this disease in the home and school room, are too well known to warrant any further discussion.

DISCUSSION

Dr. J. J. McShane, Springfield: Dr. Koehler mentioned in his paper that I would discuss statistics relating to undulant fever and tularemia in Illinois.

The first case of tularemia reported in Illinois was in 1926. This case was reported by Dr. Tom Kirkwood of Lawrenceville and since that time, approximately 125 cases are reported yearly. For the five-year period, 1930-1934, seven hundred and eleven cases were reported in Illinois. Twenty-one counties did not report a single case for this five-year period, all of these being located in the northern part of the state, with the exception of two counties, one of which was in the central and the other in the extreme southern part of the state.

Of the total of 711 cases, 217 occurred in the northern half of the state and 494 in the southern half. Ten southern counties reported approximately half of the cases during this period. Of the 217 cases reported in northern Illinois, 97 were reported from Cook County, which included 74 from Chicago, giving a total of 120 cases in the other northern counties as compared with 494 in the southern counties.

We find in studying 418 downstate case histories that 215 occurred in males and 161 in females. The oldest case was 74 years of age and the youngest eight. The average age for the five-year period was 36.9. Three hundred and sixty-two were found to have obtained their source of infection from rabbits; three from dressing squirrels; one bitten by pet squirrels; four from opossums; two bitten by ticks, one on neck and one on hand.

Three hundred and eighty-four were of the ulceroglandular type, seven occulo-glandular, eleven typhoidal, thirty-eight no history.

TULAREMIA

Year	Cases	Deaths
1930	140	2
1931	129	4
1932	134	4
1933	174	9
1934	134	11
	711	30

Examination of figures representing the monthly total of cases reported for the past five years, shows that in Illinois, the tularemia season and the rabbit season are the same. The annual rise and prevalence begins about the first of November and the most marked fall occurs in February. The peak of the wave is usually reached in December with January second in importance from the standpoint of prevalence.

The first cases of undulant fever were reported in 1927. Five cases were reported for that year, 1 for 1928 and 37 for 1929. During the five-year period, 1930-1934, four hundred and fifty-four cases were reported in Illinois. Twenty-seven counties did not report a single case for this five-year period, all of these counties being located in the southern part of the state, with the exception of two counties, which were located in the northern part. This is directly opposite of the tularemia distribution.

UNDULANT FEVER

Year	Cases	Deaths
1930	63	6
1931	124	7
1932	72	5
1933	94	2
1934	101	5
	454	25

During this five-year period, 375 cases occurred in the northern half of the state. Sixty-eight of these cases occurred in Cook County, which included 60 from Chicago, leaving a total of 307 reported in the other counties in the northern one-half of the state. For the corresponding period, 78 cases were reported in the southern half of the state.

From a three-year study of 226 downstate case histories, we find that the youngest case was reported in a baby girl, one year of age, and the oldest was in a 55-year-old male. It was noted that 63.1% of the cases reported were males and 32.9% females; 4% the ages were not given. Thirty-six males and 40 females drank milk but did not come in contact with animals.

Fifty-nine males and 4 females drank milk and also had direct contact with animals. It is impossible to determine whether these persons obtained the disease from drinking milk or from direct animal contact. Twenty-eight males and no females were found to have had direct animal contact only—not drinking any milk. In the histories of thirty-seven males and 2 females, the source of infection was undetermined.

BIBLIOGRAPHY

1. Starr, L. E.: Undulant Fever and its Relation to Brucelliasis in cattle and swine in Virginia. Tech. Bull. 48, Virginia Agric. Exp. Station, May, 1933.
2. Giltner, Ward: Brucellosis, a Public Health Problem. Mich. State Coll. Agric. Exp. Station, Bacteriologic Memoir No. 1.
3. Cotton, W. E. (1930): Infectious Abortion of cattle, swine and sheep, 11th Int. Vet. Congress, London II, pg. 133-147.
4. Ibid.
5. Hardy, A. V., Jordan, C. F., Borts, I. H., and Hardy, G. C.: Undulant Fever with special Reference to Brucella Infection in Iowa, Natl. Institute of Health Bull. 158, 1931.
6. Watkins, W. W., and Lake, G. C.: Malta Fever with special Reference to the Phoenix, Arizona, Epidemic of 1922. J. A. M. A., **89**: 1581-1584.
7. Ibid.
8. Ibid.
9. McShane, John J.: Personal communication.

LABORATORY AIDS IN THE DIAGNOSIS OF FEVERS OF OBSCURE ORIGIN

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The balance between heat production and heat loss through skin and respiratory surfaces may be disturbed by a variety of causes. Infection is one of the commonest causes of disturbed metabolism leading to rise of body temperature. We will consider those infections giving rise to continued fevers in which the signs and symptoms are frequently indefinite and yet in which bacteriological and serological tests are often of great assistance to the diagnostician.

Centralized laboratories, such as those operated by the State Department of Public Health, cannot offer tests or services which require the presence of the patient in the laboratory. They can, however, be of assistance by examining a great variety of secretions and other materials which the doctor collects from his patients and submits to these laboratories.

Several diseases, such as meningitis, influenza, syphilis, gonorrhea, acute arthritis, and trichiniasis give rise to fevers lasting two weeks or longer, but there are usually some characteristic signs to direct attention to the cause of the fever. Tuberculosis, sepsis and typhoid fever contribute the greatest number of cases of continued fevers.

When typhoid fever is atypical, with an absence of the classical signs, and no suggestive history, it is a real diagnostic puzzle until laboratory tests are performed. In addition to the typhoid bacillus, other related microorganisms produce similar enteric fevers. Aberrant forms of disease are likely to be more frequent when these related bacteria are involved. In the great majority of cases of sepsis the cause of the fever is usually easy of discovery. It is chiefly in the cases of endocarditis and deep abscesses such as in or around the liver and kidneys that the causative factor is obscure. Fortunately for the patient, these abscesses are usually well localized. Bacteriologic tests cannot help the diagnostician in these infections except by elimination of other possibilities in the differential diagnosis. Tuberculosis of the lymphatics, bones, joints, or meninges makes itself apparent in the physical findings and symptoms. Renal and early pulmonary tuberculosis are, however, frequently difficult of diagnosis.

Two diseases of animal origin, undulant fever and tularemia, give rise to persistent fevers, and both of them may be difficult of recognition under certain circumstances. Undulant fever is a disease particularly difficult to detect without the aid of laboratory tests. The signs and symptoms are quite variable, and in different patients may simulate various other unrelated diseases. Tularemia, in the great majority of cases, is accompanied by a definite history of exposure to rabbits, and in about 80% of the cases in our experience, the disease is of the characteristic ulceroglandular type. On the other hand, typhoidal tularemia, in which fever alone is the principal finding, is a troublesome diagnostic problem until recourse is had to laboratory tests. About 10% of Illinois cases of tularemia have been of the typhoidal type.

Pulmonary Tuberculosis. In pulmonary tuberculosis, the demonstration of tubercle bacilli in the sputum is the most conclusive evidence of the presence of the disease. Unfortunately in many early cases the bacilli are either not present in the sputum or are so few that their detection is difficult. There must be some communication

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between the lesion and the bronchi before tubercle bacilli are found in the sputum. It is commonly stated that the sputum is positive in 30 to 35% of early cases of tuberculosis of the lungs.

The chances of finding tubercle bacilli are greatly increased when a good concentration method is used instead of direct smears of sputum. It has been the routine practice of the Illinois Department of Public Health Laboratories for a number of years to concentrate all sputum specimens submitted for microscopic examination for tubercle bacilli.

It should be remembered that negative sputum findings have little diagnostic significance. Numerous negative results over a period of time do not exclude the possibility of the disease; they do, however, lessen the probability that the patient has pulmonary tuberculosis. In children or other patients from whom true sputum cannot be obtained, recourse may be had to an examination of the feces or gastric contents. Acid-fast bacilli in the feces may be derived from swallowed sputum in these cases. Other non-pathogenic acid-fast bacilli derived from the diet constitute a possible source of error in smear diagnosis of feces. Before a positive diagnosis of tubercle bacilli is made in such cases, the suspected organisms should be proved to be pathogenic for guinea-pigs. If tubercle bacilli from swallowed sputum are found in the feces, they can be found with less difficulty in the sputum itself, and have more significance from the latter source.

Examination of gastic contents for tubercle bacilli has been done especially in children. Recent reports by Nalbant and by Mishulow, Kereszturi, and Hauptman indicate that repeated examinations of the feces by smear and guinea-pig inoculation will yield as much information as can be obtained from gastric lavage specimens. It is obvious that gastric samples are not as easy to obtain as fecal specimens. When the child is not hospitalized, it is especially difficult in most cases to collect gastric samples, whereas fecal examinations can be made as often as desired without any discomfort to the patient. Suspicious organisms from gastric lavage material should also be tested in guinea-pigs before being definitely labeled tubercle bacilli.

Chemical tests for albumin in the sputum are too commonly positive in a variety of respiratory infections to be of significance in the diagnosis of tuberculosis. When the albumin test is persistently negative, it may be helpful in excluding the probability of tuberculosis.

The complement fixation test in tuberculosis is a laboratory procedure of questionable diagnostic value. There is no doubt that specific complement-fixing antibodies are frequently present in the sera of persons with tuberculous infections. The difficulty arises when it is found that patients having non-tuberculous infections and also that apparently healthy persons give a rather high percentage of positive reactions. The test is usually positive in patients having clinically obvious tuberculosis, but diagnostic help is not needed in such cases. Table 1, taken from Topley, indicates in general the results that have been obtained.

TABLE I. COMPLEMENT FIXATION IN TUBERCULOSIS

Type of Disease	Per cent. Positive
Pulmonary tuberculosis with positive sputum...	85
Clinically tuberculous pleurisy.....	46
Tuberculous peritonitis	80
Tuberculous meningitis	Rarely positive
Glandular tuberculosis	38
Bone and joint tuberculosis	50
Renal tuberculosis	90
Healthy persons	10-15
Non-tuberculous disease	10

(From Topley, "An Outline of Immunity," Wm. Wood & Co., 1933.)

Much experimental work has been done in recent years on the complement fixation reaction in tuberculosis. Numerous extracts and preparations of tubercle bacilli have been used as antigens in the test, without having refined the test to an appreciable extent. At the present time, the result obtained with the serum of a given patient must be considered in conjunction with all other findings on that patient. If other signs point to the existence of a tuberculous infection, a positive fixation reaction has supportive value; a negative reaction should not weigh too heavily against the other findings.

Renal Tuberculosis. Patients with renal tuberculosis may show no symptoms for a long time. Attention is directed to the condition when symptoms appear, and this is usually after the lesion has broken down and tuberculous material has gained access to the pelvis and ureter. It is at this stage that tubercle bacilli can be found in the urine, and their finding is of real service in establishing the diagnosis. Catheterized samples of urine, in which acid-fast bacilli are found, should be injected into guinea-pigs to distinguish tubercle bacilli from smegma bacilli. Study of

the urine from each kidney separately is of importance when surgical removal is considered.

From the relatively high percentage of positive complement fixation reactions obtained in renal tuberculosis, this test may be used to advantage to substantiate other findings in suspected cases.

Other kidney infections lend themselves readily to bacteriologic diagnosis. The repeated finding of pyogenic organisms in carefully collected samples of urine is of value in establishing the etiology in these cases. Perinephritic abscesses must be discovered by other than laboratory methods. The causative organisms are not accessible and the bacteriology of the abscess material after operation is only of secondary interest in most cases.

Typhoid Fever and Related Infections. Typical cases of typhoid fever are relatively easy of diagnosis and laboratory findings serve only as confirmatory evidence. When the disease is not typical, the diagnosis depends very much upon the results of laboratory tests. Typhoid bacilli have been found occasionally in sputum and in the rose spots on the skin—but for practical purposes, blood, feces, and urine are the most likely materials from which to cultivate the organisms. For an early clear-cut diagnosis, nothing is superior to a positive blood culture. The bacilli appear in the blood even in the first few days of the disease and can be isolated very easily in pure culture. A specimen of blood (5-10 c.c.) drawn into a sterile tube is all that is needed. The clot, freed from inhibiting substances of the serum, can be cultured in suitable medium. The serum which has been removed from the clot can be used for a Widal test. Thus a single sample of blood serves two purposes. Our laboratories have been culturing clots from all blood specimens from fever cases, even from those on which only a Widal test has been requested. We are using a bile medium which gives excellent results. This method is yielding higher percentages of positive results over longer periods of time than have been obtained with other media.

Under ideal conditions, a definite diagnosis of typhoid fever is made early by finding typhoid bacilli in the blood. In obscure cases, or if for any reason blood cultures have not been made, the organisms can be isolated from the feces in a large percentage of cases during the second and third weeks of the disease. There is also a sharp rise in the number of positive Widal tests in the second week. Urine is not good material to examine for typhoid bacilli. Positive urine cultures are obtained late in the course of typhoid fever but a great many typhoid patients apparently do not excrete the bacilli in the urine. The chief importance of culturing both feces and urine is in releasing patients from quarantine, since it is by these excretions that persistent carriers infect other persons.

The paratyphoid fevers are often atypical and diagnosis is obscured by the variations in clinical pictures. Laboratory methods of diagnosis are essentially the same as in typhoid fever. Positive blood cultures present the best diagnostic evidence and, as the bacteremia is frequently of longer duration than in typhoid infections, positive blood cultures are often found over a relatively longer period of time. Emphasis is placed on blood cultures in the paratyphoid diseases because of two factors. There are certain varieties of so-called "para-typhoid-like" organisms whose status as disease producers is not clearly established; and transient gastrointestinal upsets produced by these related bacilli, and even by true paratyphoid bacilli, may result in positive stool cultures. Because of the above conditions a positive blood culture is the most reliable indication of actual invasion of the body.

The Widal test in typhoid fever and similar agglutination tests in the paratyphoid infections could be discussed at great length. The effects of previous vaccination, individual variations in agglutinin production, non-specific anamnestic responses, and the newer conceptions regarding somatic and flagellar agglutinins, are some of the factors bearing upon the interpretation of the results of such tests. Immunologists specializing in this field are not agreed upon the significance of many of the observed phenomena; and the general practitioner would have time for little else if he attempted to read and digest all that is presented in the literature on these subjects. As a practical alternative, problems of interpretation of laboratory findings should be referred back to the laboratory. A brief sketch of the pertinent history of a given case together with the agglutination results is enough ordinarily for the laboratory to give an opinion based on the latest reliable information.

TABLE 2. APPROXIMATE PERCENTAGE OF POSITIVE FINDINGS IN TYPHOID FEVER CASES OF AVERAGE DURATION

	Weeks			
	First	Second	Third	Fourth
Blood Culture	90	75	40	20
Feces Culture	15	60	85	60
Widal Reaction	10	75	85	90
Urine Culture	0	5	25	10

(From Park & Williams, "Pathogenic Microorganisms," Lea & Febiger, 1933.)

Bacterial Endocarditis. Endocarditis in its broadest sense may be defined as an inflammation of the endocardium. Various classifications of the different clinical conditions and theories of pathogenesis need not enter into this discussion. Whatever information may be secured from bacteriologic examinations of the blood must be interpreted by the physician in the light of other findings on a given patient. From the standpoint of the bacteriologist, there are several factors bearing upon this interpretation. The bacteria which have been cultured from blood are of the same types commonly found in the nose and throat. As might be expected, any disturbance of the upper respiratory tract, either inflammatory or traumatic, offers an opportunity for the possible invasion of the blood-stream by this bacterial flora. This idea is borne out by the frequent finding of positive blood cultures during active inflammation of the nose and throat. Several workers have also shown that these throat organisms may become temporary invaders of the blood-stream during or following tonsillectomy. It is therefore apparent that the mere presence of such bacteria in the blood does not prove their etiologic connection with any heart condition in a given patient. Another factor enters into the interpretation of positive blood cultures when the organisms isolated are staphylococci. Here one must bear in mind the wide distribution of these cocci and especially their constant presence on the skin. All steps in the collection and handling of blood specimens must be rigidly controlled to prevent the introduction of staphylococci from the skin.

On the other hand, negative blood cultures may be obtained under certain conditions from true cases of bacterial endocarditis. One factor leading to such a result is the intermittent discharge of bacteria from the lesions into the circulating blood. Samples of blood collected at times when no bacteria are being liberated will of course be negative. Another factor leading to a false negative result is the fastidious nature of the bacteria causing certain forms of endocarditis. A common example is the gonococcus. Even under the best conditions, and when the laboratory is aware that gonococci are expected in the blood-stream, this organism is difficult to cultivate.

From the above it is apparent that the result of a single blood culture, either negative or positive, is of slight diagnostic value. Much more significance can be attached to the laboratory findings when repeated cultures consistently yield the same result.

Undulant Fever. Undulant fever, with its variable symptomatology and uncertain course and duration, is very often a difficult diagnostic problem. The most careful physical examinations commonly end with the examiner having found nothing of significance. Such findings in a fever patient should always suggest the possibility of undulant fever. The test which has been of most value in public health laboratories is the agglutination reaction with the patient's blood serum. Cultures of blood, feces, and urine have been disappointing in most cases. Blood drawn and immediately injected into guinea-pigs has given the best results in isolating the causative organisms. Good cultural results have also been obtained when the blood is immediately discharged into suitable culture medium and incubated for 4 or 5 days before being sent to the laboratory. Although a positive result would furnish the best sort of evidence, these cultural methods have been found to be too inconvenient and impractical for general use.

The agglutination test is much simpler and in the usual case with long-drawn onset, the serum is ordinarily positive at the time of the doctor's first visit. A common question is what titer should be considered significant in the evaluation of positive agglutination reactions in undulant fever? In other words, is a positive reaction in a dilution of 1:40 or 1:80 definite evidence of active undulant fever? It is especially in cases of uncertain clinical diagnosis that agglutination findings form an important part of the evidence on which a diagnosis is based.

From studies of the general population and also of certain selected groups, there are available some data of value in this connection. If we obtain positive agglutination at a titer of 1:10 the odds are about 15 to 1 that the patient

is infected. When the titer reaches 1:50, the odds are about 100 to 1 that the patient is infected. At higher titers the probability of infection rises rapidly.

A different interpretation must be used when the patient belongs to specialized occupational groups such as butchers, slaughter-house employees, or rural veterinarians. While persons engaged in these occupations run a relatively greater risk of active infection, they are also liable to the development of agglutinins through latent infections. The chances are about even that a veterinarian engaged in farm practice will show a titer of 1:50 regardless of the nature of his present infection. If his blood agglutinates at titers between 1:100 and 1:500, the odds are only about 4 to 1 that he is infected. Likewise 1 out of 10 butchers or slaughter-men will probably show a titer of 1:40 in the absence of active infection. It is necessary, therefore, to know the occupational group to which a given patient belongs in order properly to weigh the evidence obtained from agglutination tests for undulant fever. In cases where a titer of doubtful significance is obtained, additional samples of blood at intervals will show a definite rise in titer when the fever is due to active infection.

Tularemia. There is no difficulty in making a diagnosis of tularemia when the patient gives a history of handling rabbits, and presents an ulcer with involvement of the lymphatics draining the infected area. When such history is not obtained, or when there is no ulcer at the point of inoculation, the cause of the fever is not so evident. About 10% of Illinois cases have been of this obscure "typhoidal" type, in which fever is the only definite sign. The most useful laboratory procedure in all forms of this disease is an agglutination test with the patient's blood serum. The test is usually definitely positive during the second week and the antibodies persist in the blood for years.

There are two precautions to be observed in connection with laboratory tests for tularemia. One is that a negative result may be obtained on blood that is drawn early in the course of the disease. If additional samples are drawn later, after the agglutinins reach a detectable concentration, this pitfall will be avoided. Another chance for misintrepretation occurs where a positive result is due to antibodies persisting from a previous tularense infection. That is, a patient may have a fever due to some unrelated cause, and at the same time his blood will show tularense antibodies because he had tularemia in the past. In such instances a more detailed inquiry into the medical history of the patient will usually clarify the situation. Besides this questioning of the patient, repetition of the test will show little or no increase in the concentration of antibodies if the present fever is not due to tularemia.

SUMMARY

1. Isolation of pathogenic organisms or demonstration of antibodies can be of assistance in the diagnosis of certain fevers of obscure origin.

2. Actual demonstration of pathogenic bacteria in materials from the patient furnishes the best diagnostic evidence in most infections. The limitations to this approach have been discussed.

3. The findings of specific antibodies in the patient's blood is indirect evidence of infection. The medical history and occupation of the patient are of importance in determining the significance of both positive and negative results.

4. Repeated laboratory tests yield more conclusive evidence than single tests.

DISCUSSION

Dr. Cecil Jack, Decatur: The essayist has given an able paper as to what help the physician can obtain from the laboratory in his diagnosis of obscure fevers. The laboratory may make the diagnosis when our clinical observation fails, as in undulant fever, or it may confirm our diagnosis as in tularemia or typhoid. In tularemia and undulant fever the skin test has now been perfected and is positive much earlier than the agglutination test. In sepsis a positive blood culture aids us in identifying the causative germ, thus helping us with our prognosis. In endocarditis the same may be said. In a recent case, blood culture early disclosed that it was a blood stream infection while the heart murmur did not appear until shortly before death.

The essayist speaks of the value of sputum tests in tuberculosis. This has not been our experience. To determine the value of sputum examinations in pulmonary tuberculosis we recently took sputums on all the patients at the Macon County Sanatorium on one particular day. Of these 63 patients, 25 were far advanced, 23 moderately advanced and 15 minimal. Of the far advanced 9, or 36%, were positive on this day; 21, or 84%, had positive readings sometime during their stay in the Sanatorium. Of the moderately advanced, 4, or 17%, gave positive readings on this day, whereas 12, or 52.2%, gave positive reading some time during their stay. Of the minimal group none of the

15 gave a positive reading on that day, whereas only one of this group gave a positive reading during the stay in the Sanatorium. One patient, a minimal case, did not develop a positive sputum until he had been in the Sanatorium for three months, and sputums were examined weekly. However, another laboratory comes to our aid—the x-ray laboratory. Well-taken stereoscopic films, expertly interpreted, have far outclassed any one aid in our diagnosis of pulmonary tuberculosis.

BIBLIOGRAPHY

Topley, W. W. C.: "An Outline of Immunity," Wm. Wood & Co., 1933.

Mishulow, Kereszturi, and Hauptman: Amer. Rev. of Tuberculosis, 29: 471, 1934.

Nalbant, J. P.: Ibid., p. 481.

THE TREATMENT OF OBSCURE FEVERS

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The term obscure fevers is used in this paper for want of a better name to designate two groups of disease processes. 1. A group which at the outset is difficult to diagnose but later is proven to be a pathological condition caused by a known etiological factor. 2. A small group characterized throughout its course by fever of unknown origin. Several of this latter group have been the subject of thorough studies. No known germ or cause could be found as the causative agent. Some of these cases presented features that had some of the characteristics of Hodgkin's disease, others blood stream infections, others nervous phenomena, and still others were negative in every respect except for the presence of a more or less persistent fever. As the diagnostic features of obscure fevers have been presented in another paper, an attempt to outline the treatment will be made in this paper.

What is a fever? A continuous mouth temperature of 99 degrees F. should be looked upon with suspicion and a careful search made to discover a cause for the slight but persistent elevation of temperature. The National Tuberculosis Association has established a standard that seems to me to be most satisfactory. A temperature which persistently runs over 99.4 degrees F. when taken at least four times daily over a period of one week with the thermometer in the mouth at least five minutes should be considered of significance and should constitute a fever. The normal temperature is about 98.4 degrees F. with diurnal variations of about 1 degree F. lowest in the morning between hours of six and seven, and highest in the afternoon between hours of five and six.

Heat production occurs mainly by oxidation and chemical changes in the muscles and also to some degree in the liver and kidneys. Heat dissipation is mainly by radiation and conduction through the skin; this accounts for about 75% of the total loss. Evaporation by sweat accounts for about 14.5%, expiration about 10.7% and the excretions about 1.8%.

Hyperpyrexia may be produced by several agencies, as food, exercise and environment, which may be considered normal. Barbour's definition of fever is "any positive heat balance due not solely to food, exercise or environment."

Under normal conditions the heat regulating mechanism with its center near the optic thalamus and corpora striata is adjusted to about 98.4° F. In fever due to disease the adjustment is to a higher level and is not as perfect as under normal conditions, and gradually as the disease improves, as for example in typhoid fever, the temperature approaches normal, better and better results follow hydrotherapy, and as time goes on the temperature level is finally again established at normal. During this fever it is possible that toxins produced by the disease producing germs present caused the tissues to break down and in this way increased the osmotic pressure of the protoplasm. Water is taken in from the blood, reducing the volume of the blood. The superficial capillaries are apparently more affected than the deep vessels and consequently the skin becomes cool; the nervous reflex against cold is aroused and shrinking of the superficial capillaries take place. Shivering at times may result; this is nature's way of producing more heat.

During this fever there has also been a derangement in heat dissipation. When the temperature of a normal person is raised 1 degree C. a marked increase in cutaneous blood flow follows and profuse perspiration results. In a fever case this may not take place. The heat regulating mechanism is fixed at a higher level. Experimentally animals have been exposed to moist heat for considerable periods of time without serious results. This points to the fact that possibly the injurious results in fevers are due to

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the toxins of the infectious agents. Practically, however, it seems in the experience of the clinicians that excessive temperatures must be controlled. It is recognized that fever is apparently a protective measure on the part of the body. It impairs the viability of organisms; the increased metabolic activity increases the resistance to infection but when in excess of 103 degrees in prolonged fevers as typhoid or 105 degrees in short febrile attacks efforts must be made to reduce the fever. Simple hyperthermia is an elevation of body temperature with its attending changes. Fever is a more complex phenomenon in which the effects of hyperthermia are complicated by the effects of other agents of chemical or toxic nature. In fevers immunological reactions in the blood are noted and the reticulo-endothelial system shows greater phagocytic activity.

Hyperthermia can be produced experimentally by injection of proteins or their split products. Presumably they cause destruction of tissue protoplasm with increased formation of heat. Similar effects are seen as the result of absorption of sterile blood clots. The degree of fever after coronary occulsion may be an index to the extent of the damage to the heart muscle. Excessive pyrexia from whatever cause, produces depression of the central nervous system and impaired respiration followed by circulatory embarrassment and ultimately general asphyxia. Hydrotherapy and antipyretic measures should be used to control fever and bring the temperature down to 101 degrees to 103 degrees F. Nothing is gained by allowing a continuous temperature in excess of 103 degrees F. It should be remembered, however, that merely lowering the temperature does not necessarily lessen the toxicity of toxins in the body.

Another factor to be recognized in pyrexia is partial starvation due to impaired desire for food, and an increased breakdown of protein to meet caloric requirements. It is, of course, recognized that protein decomposition is also caused by high temperature and the action of toxic decomposition products. The destruction of protein is indicated by the increase of creatinin, purin bases, and incomplete hydrolyzed proteins as albumoses in the urine. The effect of starvation can be met by careful attention to the diet.

Aside from infectious processes, parenteral injection of foreign protein, and excessive destruction of protein in the body itself there should be mentioned for the sake of completeness three other causes of fever; namely, action of certain drugs, nervous influences and injury to the base of the brain and upper levels of the spinal cord.

TREATMENT OF FEVER OF UNKNOWN ORIGIN

The greatest difficulty in adapting this paper to meet the requirements is that it is impossible to prescribe a method of treatment for a specific condition. However, in asking for a paper to discuss this topic it is inferential that frequently a physician is confronted with just such a situation and to meet this predicament a paper has been called for to discuss this subject. The speaker, as well as all other physicians, who has been in practice for a number of years has been called upon to treat these cases; sometimes the results have been satisfactory, at other times not so satisfactory. In preparing this paper the speaker has reviewed the literature of recent years and combining the experience of others with his own an effort will be made to outline the treatment.

It is axiomatic that the treatment should not cause any harm. When called upon to treat such a case the physician is always concerned as to the possibility of a grave disease being responsible for the fever. The most important step in the treatment is:

1. Rest. Complete rest in bed, with careful attention to all needs and with a minimum of exertion on the part of the patient. Mental rest as well as physical rest should be enforced until it is seen the patient will be benefited by some form of entertainment later. Attention should be given the mouth, proper cleansing of the teeth and gums should be instituted; the tongue should be inspected at each visit. A good simple mouth wash is hydrogen peroxide diluted one half with water. Steps should be taken early to prevent bed-sores. By changing the position of the patient from side to side hypostatic pneumonia may be prevented, especially in the aged. See to it that the room is thoroughly ventilated and that the humidity of the air is within normal range. In winter a common cause of extreme discomfort in bed ridden patients is excessive dryness of the air; this may also be a predisposing factor to complications in the respiratory passages.

Adequate sleep is very important. Rules of quiet should be enforced in the household; the simple procedure of turning out the lights in the bed room sometimes favors sleep.

2. Drugs. Hypnotics should of course be used where necessary. It is my policy to use morphine only as a last resort unless there are urgent reasons for its employment which I will not mention here. Phenobarbital, acetylsalicylic acid, bromides, amytal and codeine are satisfactory drugs in many cases. In delirium and cases presenting mental symptoms hyoscine may have to be used and measures taken to confine the patient to the bed.

3. Diet. During the first few days of a fever case it is not necessary to observe so carefully the caloric intake. But if the case proves to be a protracted siege of fever, it is extremely important to pay careful attention not only to the quantity but also the quality of the food. Thirty calories per kilogram in 24 hours are necessary, but this may be increased to 40 calories if the temperature averages 102 degrees F. and even to 50 or 60 calories in higher temperatures.

Carbohydrates are especially desirable in fever in order to counteract the tendency to acidosis because the fatty acid molecules are not properly oxidized.

Milk is of course a most important article of diet. An adult weighing 150 pounds should have from 2,100 to about 2,800 calories in 24 hours; of this protein would constitute about 65 to 80 Gm., the bulk would be carbohydrates as fat is not well utilized in fever. It is evident that a fever patient can not comfortably take enough milk to meet the requirements of his body as one liter of milk has about 700 calories. He may take two liters, so it is necessary to make up the rest in carbohydrates, or milk in the form of buttermilk or soups. Over 1,000 c.c. fluid is necessary in twenty-four hours. It may be necessary to give liquids by hypodermoclysis or proctoclysis, and in children intraperitoneally. The milk will take care of the protein but about 800 calories of carbohydrate will have to be added in the form of cereals, gruels, vegetables, fruit juices and sugar.

If the mouth is not too dry, solid foods may be given if the patient's condition warrants it. Coffee or tea if there are no contraindications may be given once or twice daily.

In constipation cooked fruits and vegetable purees are helpful. Cascara sagrada is useful if a cathartic is required and enemas if hard stools are present.

The use of dextrose should be mentioned. Five per cent. dextrose solution can be given to prevent hypohydration. This may be combined with a physiological solution of sodium chloride in case of hypochloridemia. Ten per cent. dextrose is used where carbohydrate is required; and 25% dextrose may be given in amounts of ten to twenty c.c. slowly several times a day when the heart is failing. This is especially used in prolonged inanition.

Antipyresis is indicated in temperatures in excess of 103 degrees F. in prolonged fevers and 105 degrees F. in short fevers. In typhoid fever some favor giving the Brand tub baths when the temperature reaches 102.5 degrees F.

Sponge baths once or twice daily is good in all cases. The stimulating effects on the nervous system, the circulation and the general tonic effect are very beneficial. Elimination is also favored, and resistance to infection increased.

When cold is applied to the skin it is well to take care to prevent an untoward reaction. Keep the skin red by massage or by the use of a mustard pack. A cold wet pack may also be used as a sedative in case of restlessness.

Many so-called fever mixtures owe their beneficial effect to elimination. There are several diuretics and cathartics that are useful. Sodium citrate and squills are beneficial, infusion of digitalis where cardiac symptoms are present during a fever; and calomel, and aloes as laxatives are useful.

Medical antipyretics depress metabolism while lowering the temperature, nevertheless they are useful in allaying headaches and general discomfort aside from the high temperature. In this group of drugs are found quinine, the salicylates, and the pyrazolparamidophenol compounds.

Quinine, aside from its specific effect on the malarial parasite, lowers metabolism, slows the pulse, relieves pain and has a calming effect on the nervous system.

The salicylates are of special value in acute rheumatic fever; acetylsalicylic acid is of especial value in relieving pain.

In the pyrazolparamiodphenol group is acetanilid, a drug of considerable value as an anal-

gesic. It should be used with care and discontinued if pallor, cyanosis, faintness or heart symptoms are produced. Acetphenetidin and amidopyrine are also of value. In the use of some of these drugs the relationship between the benzol ring and agranulocytosis should be kept in mind.

Antipyrine is especially useful because it can be used in liquid form and also in enemas.

If collapse symptoms appear digitalis, strychnia, caffein sodium, benzoate, or caffein as coffee is of value. Camphor is of especial value in emergencies. Epinephrin is also of value, and atropine of particular value in collapse in pneumonia. Amyl nitrite and aromatic spirits of ammonia are also popular measures.

Abdominal binders, bandages around the limbs and elevating the foot of the bed are mechanical measures that may be of some help.

During convalescence watch for rapid pulse after slight exertion or excitement, and if noted keep the patient in bed longer. Iron and arsenic are of value during this period.

During this time the physician who has had a case of fever of indeterminate cause under his care has been using all known measures to determine the diagnosis. Aside from the history and a complete physical examination, x-ray and laboratory examinations have been completed. In some cases repeated laboratory tests have been made. In a recent case under my care repeated blood examinations were made before finally a positive paratyphoid B. was obtained. In another case repeated sputum examinations failed to show the B of tuberculosis in a patient ill for several months with a pulmonary disorder, finally a search was made for fungus infection and a mycelium showing the characteristics of a sporothrix was found. This cleared up promptly after the use of potassium iodide.

It is well to remember that the more common infections are the most likely to be found in this search, so the laboratory tests should at first be directed in this direction. Influenza may be puzzling, and keep in mind malaria. A patient returning from the south, or who has lived in the south may harbor the parasite for years. Bronchitis, bronchicetasis, syphilis, tuberculosis and the insidious onset of a malignant growth and pernicious anemia should always be kept in mind. Typhoid fever may come on with most obscure symptoms; the same holds true for paratyphoid A and B. Relapsing fever occasionally is seen. Undulant fever is no longer a rarity in this country, and the same holds true for tularemia and spotted fever. Pyelitis and a perinephritic abscess should be kept in mind. Food infection and subacute bacterial endocarditis should never be forgotten in this search. Aside from the ordinary examination of the blood stream always remember to look for infectious mononucleosis and agranulocytosis. Sinusitis and hyperthyroidism should never be overlooked. Typhus fever in its camouflaged form Brill's disease may be met with, aleucemic lymphatic leucemia may also be seen.

Hodgkin's disease may have an insidious onset, this is especially true of the Pel-Ebstein type characterized by a fever of relapsing type. An afebrile period of several days may separate the periods of fever. There may be no enlargement of the lymph nodes or the spleen. A blood examination may settle the diagnosis.

Diverticulitis and diverticulosis should also be looked for. Encephalitis and epidemic pleurodynia are not so likely to escape diagnosis if kept in mind.

The term obscure fever does not necessarily mean a new disease, but it also covers those clinical conditions frequently met with that may camouflage their presence and be difficult to diagnose.

Having found one of these diseases to be present the treatment is directed toward this particular disease and is outside the province of this paper. But after this clearing of the field we still have with us a small group of cases that persist in hiding their identity.

Examples of this type are the three cases of unexplained anemia and pyrexia reported by O'Donaghue and Witts. In all three the attack lasted over six months with negative Van den Bergh reactions, and no evidence of nutritional disorders. These cases were apparently cured by transfusions.

Chevallier and Bernard have described a case presenting some of the features of the three cases just mentioned and also some features of an attenuated Hodgkin's disease. This case was cured by x-ray after three months treatment.

These four cases suffice to illustrate a group of cases that need further study. Are they dis-

ease entities of hitherto unknown diseases or are they variants of already known diseases? A significant fact is that transfusion and x-ray apparently cured these cases.

Another group that might be called the neurogenic psychogenic group is illustrated by a case reported by Reimann. Although many deny that purely nervous or psychic factors may cause fever, there is evidence to show that fright, worry, hysteria and mental disturbances may do so. The case reported was a woman and had a fever especially noticeable during the latter half of the intermenstrual period. This case had been known to have a fever for nineteen years and all known causes had been eliminated. If fever from ordinary causes is associated with a deficit of free water in the body, it seems that it might be possible in the so-called neurogenic psychogenic group that are absolutely negative as far as physical findings are concerned that the fever is due to an unstable heat regulating center. Many of these patients are women and the menses seemed to play a part in some cases. Possibly some of these women may be sensitized to their own blood.

In these cases drug treatment has proved unsatisfactory. The measure that seems to have given the best result is rest and the assurance that the fever does not mean tuberculosis or any other serious disease. The prognosis is good as far as the mortality is concerned. Here again further study is needed as it might be possible that at least some of these cases represent a hitherto undetected disease entity.

SUMMARY

1. In the management of a fever of obscure origin symptomatic treatment is indicated until the cause of the disease is finally determined. Rest, hydrotherapy to keep the fever within bounds, an adequate diet to meet the needs of the patient, and the ordinary simple drugs as indicated, usually suffice during this period of expectant treatment. When the cause is finally determined the usual treatment is indicated.

2. In the small group of febrile cases of undetermined origin, there are a number of cases that present some of the features of an anemia of unknown cause and also some similarity to atypical Hodgkin's disease. These cases have responded to transfusion and also in one case to x-ray treatment.

Another group in this second class is what might be called the neurogenic psychogenic group. This group responds best to rest and to assurance that no serious disease is present.

BIBLIOGRAPHY

O'Donoghue and Witts: Guy's Hospital Reports, **82**: 457, 1932.
Fantus: J. A. M. A., **103**: 484, 1934.
Alt and Barker: J. A. M. A., **94**: 1457, 1930.
Reimann: J. A. M. A., **99**: 1860, 1932.
Kintner and Rowntree: J. A. M. A., **102**: 889, 1934.
Wilson: Lancet, **2**: 874, 1931.

DISCUSSION

Dr. Normal C. Bullock, Rockford: Dr. Egdahl has ably dealt with this very difficult subject. He has left little to be discussed in the symptomatic treatment of obscure fevers.

There is little to do in the line of specific treatment of any disease unless a definite diagnosis can be established. It is with this thought in mind that I would like to stress the importance of the agglutination test for undulant fever in these cases of obscure fevers.

Dr. Egdahl states that undulant fever is no longer a rarity in this country. I feel that Dr. Egdahl is correct in this statement, and there is no doubt that we would discover more cases if this disease was constantly kept in mind.

Undiagnosed cases are frequently found by the examination of serums submitted for tests other than those for evidence of undulant fever.

The prevalence of this infection among persons from whom specimens are serologically tested for syphilis would probably be fairly representative of what might be expected in the general population.

In the State of New York definite agglutination of B. abortus in a dilution of serum 1:80 or higher has been obtained in from 0.3 to 0.4% of approximately 200,000 specimens received for the complement-fixation test for syphilis. Over 30% of these reactions occurred in a dilution of serum 1:320 or higher.

In a population of twelve and one-half millions, the above 0.3% would suggest 37,500 cases in the state, of which 30% or 11,250 were recent infections. These figures compared with the number of reported cases would indicate that less than 10% of the actual cases of undulant fever are now being reported.

The Illinois State Department of Agriculture estimates that 50% of the herds in the State are infected with Bang's disease. With this number of infected cattle and the recent practice of raw milk stations surrounding every municipality, it is surprising that more cases are not discovered.

It has been the practice of the Health Department of Rockford to do an agglutination test for undulant fever on all specimens of blood sent in requesting a test for typhoid or para-typhoid if these tests prove to be negative. As a result of this procedure, several cases of undulant fever have been discovered here.

We must change our line of thought regarding the incidence of diseases in looking for the cause of obscure

fevers. We constantly keep in mind the typhoid group but often neglect to look for undulant fever.

In 1934, eleven specimens of blood were examined in our laboratory for typhoid fever, none of which gave a positive test. Of these eleven specimens, however, 4 gave a positive agglutination test for undulant fever.

Dr. Egdahl, in closing: I purposely refrained from outling the treatment of the well-known diseases that are sometimes obscure in their onset. I wish, however, to make a brief reference to some new therapy. In malaria, atabrine has given excellent results. Then there is the use of the iodides in treating some of the mycelian infections, and in undulant fever the use of arsphenamine and acriflavine.

POISE OR NERVOUSNESS

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The difference between poise and nervousness lies in the control of the person through his or her nervous system. One definition of poise is a "state of being balanced." This is really an excellent definition for our purpose. Balanced action is a condition of nature for many activities. While we are discussing responses of the nervous system examples may be given in other fields as a preliminary. When one muscle contracts its opposite relaxes. Movement of the body in one direction causes compensating movements to be made in the other to maintain balance. One set of digestive glands produces acid products to aid in preparing food for absorption while another set pours out alkaline secretions for the same purpose.

The same general situation applies when we turn to the field of nervous and mental activity. Consciousness is divided into two great fields, one of thinking and one of feeling. The first is called the intellectual field. It includes the ability to acquire and retain knowledge, to connect it through thinking processes so as to arrive at a decision which in turn leads to action. It may be briefly summed up as what we know about things.

The emotional field is the second great one. It includes our response as affected by pleasure or pain, joy or sorrow, love or hate and rage, trust or fear, admiration or disgust and many other sensations, any or all of them varying in degree, some acting more powerfully than others. A summary of this field would be how we feel about things.

A balance between the intellectual and the emotional field is what makes us think of A as poised. B may be nervous because he does not have this balance. The trouble is much more likely to be in his emotional field than in his intellectual one. A and B and all the rest of us have arrived at our present stage of being as the result of evolutionary processes millions of years in the making. It is anatomically correct to say that the unborn babe passes through in nine months stages of development that represent the life history of our race and of forms that preceded ours in the sea and on the earth. Sensations mentioned previously were experienced by lower forms long before man with his mind and soul came into being. Consequently emotional response is much older and therefore has earlier claim on man than does intellectual.

The fundamental tendency towards this response at its deepest level is held in common with the animals and is called instinct. Campbell says, "The animal has an instinctive curiosity but in primitive man the horizon of this curiosity begins to be greatly enlarged and as human nature has developed the search for knowledge has come to recognize no limits." Yet in this search for knowledge certain primitive feelings must still be reckoned with.

A part of our body, called the autonomic nervous system, has much to do with the way we respond to these primitive feelings. It derives its name autonomic from the fact that it is not directly controlled by the brain, hence is more or less automatic in some ways. It is also called the involuntary or vegetative nervous system because its actions are not controlled by the will and because it has to do with the vegetative or mechanistic part of the business of living. A characteristic feature of it is balanced action between two main divisions, one causing one predominating type of response, another the opposite. Laughter, tears, blushing, pallor are some of the more frequently seen manifestations. There are others going on within the body causing changes in the flow of blood through muscles or vital organs, increase or decrease in heart rate and volume of output, variations in amount of sugar in the blood and tissues which were more important when man or his predecessors

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had to fight or run in order to insure safety. Nowadays in civilized communities the instinct of self preservation is not called on as a matter of daily occurrence, yet the mechanism is still there. Every once in a while it does something to us to disturb our poise, particularly in the way of fear. A may have whistled when he walked past the graveyard as a little boy. This was one type of response to the instinctive fear of death and of the dead. The point is that he walked past it and conquered some of that instinctive fear while B who was afraid of the dark, the instinctive fear of the unknown, wouldn't go to bed unless there was a light in the room. As B grows older he eventually goes to bed without a light but he hasn't really conquered his fear. It is still there to break out in another fashion, perhaps the fear of thinking that he has heart disease because his heart beats fast when he smokes too many strong cigars. He becomes apprehensive, is afraid to walk, to exercise, to go in crowds. He consults many doctors who tell him his heart is all right but he knows better and knows he is going to die. His instinct of self-preservation is profoundly disturbed, his nervousness assured.

The instinct of preservation of the race is equal in fundamental importance to that of preservation of the individual. Society as a whole is built upon the foundation of the family as a unit. The family unit has as its inherent organizing basis this instinct. It is refined, consecrated and inspired when adequately directed by the individuals most concerned. In addition to its part in the preservation of the race the creative instinct may be expressed in everyday life, in work, play, love and worship. When this instinct is uncontrolled, misinformed and mismanaged it is capable of causing disaster to the health and happiness of the individuals and to others as well.

One type of A is the man or woman who is happily married, may or may not have children but who is a partner in a family and a worthwhile citizen of the community. Another A may not be married but uses this driving instinct to carry out some real job. All the A's are not men. In most countries, unless decimated by war, the ratio of men to women is about 104 to 100. Well balanced women and men are working, playing, helping for the love of some person or thing, worshiping and developing a well rounded personality.

Then there are the B's whose response to this instinct is impaired. Many people think of brutal husbands or Don Juans with no consideration for their wives or other women as coming under this heading. Erring wives and loose women are likewise included. True these do make a formidable number in the uncontrolled group. Misinformed people incapable themselves of recognizing the intensity of this feeling, doubting the value of it, thinking of it on the low rather than the high plane are, however, to be found in any community as the narrow-minded gossiping zealots who are not happy themselves and do not want anyone else to be happy. The mismanaged ones may be found in married couples who do not get along and suffer for it or make their families suffer with them. Under such circumstances for any of these unfortunate B's it is not surprising that nervousness of various types arises.

A recognizes the presence of his instincts and directs them wisely. B may not have been informed of their significance, may have had their direction interfered with in childhood or in youth by many things and thereby gets into a jam at some period in life.

Above the instinctive level are other phases of growth and development. Few stop to realize how much childhood experiences both pleasant and unpleasant affect us as individuals. We comment on them in children. We speak of how they will affect those children when they grow up. We see signs of childhood traits in our relatives and friends now grown up in years at least. Yet we stick our heads in the sand when it comes to a recognition of these traits in ourselves. Child psychologists in recent years have exclaimed at great length over a fact proclaimed by Wordsworth more than a hundred years ago that "the child is father to the man."

A had the fortunate experience of what Wordsworth called "a happy childhood." His parents didn't have to have money but they were interested in him. He had something to eat, a place to sleep, clothes to wear. He had the chance to be with other children, to run, play, fight, to know animals and flowers, to find out about things without being too often frightened about them. As his horizon increased his

curiosity increased. He went to school and not only learned to satisfy his curiosity by knowing about things but also learned how to get along with others. He had discipline at home and in school and accepted it.

B started out with the same set up as A. As a baby his rest was interrupted to show him off. Parents and admiring relatives fed him, got things for him, did anything rather than have him cry. It took him a long time to get out of diapers and he had trouble at night. He was told the bogey man would get him if he cried at night and consequently had night terrors and terrifying dreams all through childhood. He didn't like this and wouldn't eat that. He wanted his own way and would have had fits of temper to get it, therefore usually got it rather than have the family have to stand for such an outburst. Is it surprising that when he started to school he had trouble doing things for himself, had trouble with his lessons, shunned other children, became sensitive? Then he had a severe illness, was sick a long time. This led to withdrawing from the world and building up a fairy world of his own where everything was lovely. He was all primed for a nervous reaction, an inferiority complex, perhaps a complete withdrawing from the real world into an imaginary world of his own.

An acute illness with the natural anxiety of parents, relatives and friends, the need for special attention, special articles of food may be an intercurrent factor in the life of the child. This is true not only from the aspect of the effect of the illness on the general state of health but also for our subject in its effect on the patient's attitude. Perhaps he has grown out of the dependency of infancy, has begun to develop that independence which we both desire and regret to see in our children. The illness has put him in the center of the stage as he was when a baby. He had to have special attention and unless carefully managed may find it hard to leave the spotlight. Convalescence needs as expert management in some instances from this angle as from physical care. Fortunately this is not often true for acute illness is more or less accepted for children and by children rather philosophically, as with measles which "everybody has" for instance, yet it has been seen to be one cause of nervousness.

Another hangover from another level of consciousness is that of superstition, myth and magical belief. This comes from the time of primitive man who interpreted what he saw going on about him in what seem to us queer ways. Yet we all have our own superstitions. Many of us who went to France have the one about three lights from a match. We all know that a black cat crossing the road isn't actually going to cause us harm yet we all hate to see one on the road ahead of us. We turn to look to be sure that it wasn't a black cat or if it was we make some comment that we hope makes us feel better.

This dependency of human beings has developed into quite a racket. Mysticism, superstition or magic leads many people to consult spiritualists, palmists, astrologers and seventh sons of seventh sons. It is part of that feeling of dependency that comes at times to grown ups when other things seem lost. It gives them something to hold on to. It may come in the intellectually over developed or the emotionally overstimulated. I do not question the sincerity of some of those who follow this type of work. Others realize it is a racket, go into it deliberately for their part of the spoils, and prey on these variegated emotions.

A may have these superstitions. If he does he recognizes them as things that have come down to him and doesn't let them interfere with his daily life. B is almost made sick at the thought of them, develops mannerisms, a facial tic or purposeless movement of the hands or repeated washing of his hands. His signs of nervousness of this type swing on from these little things to make him a dirt chaser or a germ fearer. That affects the whole day's work and life.

Education helps get rid of some of the childish ideas, helps clear up some of the superstitions, but is not the whole story. One does not have to be an intellectual giant to have poise. We have all known warped intellects whose emotions needed educating more than their intellects. Their attitude towards themselves, their families, their world, their God was so unbalanced as to make them "nervous wrecks." They can't find peace, content or happiness. Some of the most well-balanced people I know have had little education. Knut Hansum in his novel "Growth of the Soil" makes the chief character

a hard working Norwegian farmer with many obstacles to overcome but a well poised person.

There are three adaptations or ways of meeting things that A has to make to be considered a well poised person. If B fails in any one of these he has reason for his nervousness, if he fails in all he may be more than nervous, he may become mentally deranged.

The first of these is social adaptation, the ability to get along with people. A went through a perfectly natural period when younger when he was rather seclusive, self-conscious, given to day dreaming. He was growing rapidly, was acutely conscious of his growing and developing body but scarcely knew what to do with his hands or his feet or himself. He wasn't very tolerant of the ideas of others but was devoted to leadership as expressed in the form of some teacher, scoutmaster, team captain or friend. He was given the chance to express himself at home, at school, in his crowd. He developed confidence in himself, a feeling of team play and forgot in his interest in what he was doing, to think that other people were looking at him. So he acquired the ability to get along with others, to live in the world of people.

B, however, because he'd been frightened badly about something when he was little didn't have as much good fortune in his development. He couldn't let himself go with others. He got mad too easily and if he couldn't be pitcher wouldn't play ball but took his things and went home. He began to withdraw from the crowd. He realized he wasn't up to doing some things but became awfully "cocky" about what he could do. He developed a first-class inferiority complex though he tried to cover it up with a cocksureness that does not deceive a crowd of his own age or a psychologist or anyone but himself. He was terribly self-conscious and felt that he was continually under observation. Then later on this feeling of observation increased to a feeling of persecution which is bad mental hygiene. Two of the most unfavorable forms of mental disease have this as their underlying type idea.

The next adaptation that A has and B may or may not have is that towards a potential mate or life partner. This is tied in of course with the instinct of preservation of the race mentioned previously. However, this adaptation has more to do with the adult attitude. H. Crichton Miller says, "From the point of view of character development it matters relatively little whether the boy or girl ultimately marries but it matters intensely whether he or she is psychologically adjusted to the potential mate and to the conception of parenthood."

A went through the stages of first interest in his or her parents, then interest in members of his or her own sex when if a boy, girls were sissy and no good, or if a girl, boys were tough and never washed. Later, as Master or Miss A started to grow up, each became normally and consciously aware of the opposite sex. This interest at first general, eventually settled down to one person if marriage occurred, or remained general and adequate and the devotion to some creative work took its place instead.

B may have carried over a parent complex from childhood, or may never have developed the interest in the opposite sex but was too dominantly interested in his own or her sex. He or she may have gone ahead and married without being ready for it because others wanted marriage. Then some of the calamities taken up in the discussion of the effect of the maladjustments of the instinct mean nervousness often of a severe degree.

A's third adaptation or one of B's possible misadaptations is towards the infinite. Church denomination is not of importance in this. Religion is an emotional experience. Most young people have their religion presented to them. It may not take with some but most hold on to some wonder, some awe, some reverence. A may have been one of these or he may have worked out his own ideas of religion based on teaching and experience. At least he worked it out and carries it along with him.

B may have been impressed with a religion of fear, developed a fear of religion, thrown it all away and then awakened to a lost feeling. Ideas of sin either real or imaginary set up such a distracting chain of thought that the whole world looked dark and profound nervous symptoms appeared.

It can be seen from these different headings that poise is not the result of any one thing.

Heredity plays a part. This is both direct from the family tree and indirect through instinctive tendencies and responses from our primitive ancestors, man and animal. Childhood experiences, training and education are more important features. Learning how to get along with people generally, and with people of the opposite sex more particularly is an essential. A realization of the presence in life of an infinite power is a factor.

Poise represents different qualities at different ages. We have all seen well balanced children and young people as well as adults. A is not conscious of being poised nor of how or when he or she acquired this fortunate property. It is like a state of bodily health for it really is mental health. One is not aware of it except for a feeling of well being. It is only when disturbed in one way or another that its absence is noted and B is seen with us whether as a child or grown up.

If B is a grown up there is a group of characteristics that is pretty apt to be found. This is a carry over from childhood or youth of fears, prejudices, inability to get along with people, self-consciousness, feeling of inferiority, tendency to day dream. A has had some or many of these but has let go of them as a part of really growing up, or else knows they are there and uses them to good purpose. B is an adult in years, perhaps in intellectual accomplishments, but is still a child or youth in some responses to the job of living in the world of people and doesn't know it. Try to tell him and he gets mad, leaves in a huff and won't play ball. If B really has the desire to be helped and the ability to grasp it an explanation of some of these responses by a physician is often the most important thing in curing the nervousness. At least it can help him or her to "stand up and take it" if the problem is one where no other solution can be worked out. Thus B's nervousness can be treated and a degree of poise regained.

Physicians, psychologists and laymen as a whole are interesting themselves more and more in the functions of the nervous system as shown in the way a person gets along in the world and in mental health. The National Committee for Mental Hygiene is a national organization for mental health founded in 1909. There are branch groups in many states that are active in this field. The Illinois Society for Mental Hygiene published several years ago a list of precepts that I think are of value in the search for poise and the cure of nervousness. They are:

1. Pay Attention: Ability to think of the present task results in mental efficiency.

2. Cultivate Courage: Timidity, fearfulness, lack of self-confidence indicate need of mental hygiene.

3. Seek Self-Control: Not by repression of love, hate, fear, anger and other emotions but diversion of these emotions into other channels through wholesome activity.

4. Live in the World of People: Avoidance of others, inability to adapt to groups, lack of thought for others, prevents the cultivation of mental hygiene.

5. Develop Serenity: Confusion in work, play, study, conflict or ambition with achievements, conflict of thought and feelings lead to a lack of mental health.

6. Roll Your Own: Ready made toys, ready made music, ready made thoughts prevent the cultivation of some of the essentials of mental hygiene.

7. Use Your Mind: The exercise of the mind is as important to mental health as physical exercise is to physical health.

8. Live Life: Escaping from unpleasant situations through evading them, building up defenses, avoiding life is poor mental hygiene.

9. Keep Well: Mental health is related to physical health.

10. Train Your Child Early: Tantrums, jealousy, whining, finicky eating, irregular sleeping, lack of toilet habits, overdependence indicate need of mental hygiene.

I like to think of poise as a dynamic moving part of life. It is not static and immovable. That would be like a rod held at either end. A balanced rod is dynamic, can move either way but tends to swing back to its steady position. This may be a mixture of mechanics and medicine but it does bring us again to our definition of poise, "a state of being balanced."

WHY HOSPITALIZATION OF NON-SERVICE CONNECTED CASES?

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CHICAGO

Mr. Chairman and Members of the Illinois State Medical Society: The subject assigned to me, why hospitalization of non-service connected cases, seems to be in error. I believe what you are interested in, is why the non-service connected case that is able to pay is hospitalized, and I assure you this is a very difficult question to answer. I am sure that every one here could answer this to his own satisfaction, and I have eventually arrived at the answer for myself in just three words, "I don't know." In defense of the statement that I do not know, I would like to take you with me on a little journey through the channels that the ex-service man has to travel before he enters a hospital. When he enters the hospital he certifies when he signs the government form K 310 in substance, that he has not sufficient funds for his own medical care, and the penalty for falsifying in this statement relative to his financial condition carries with it a definite penalty which, I am sure none of us would like to have imposed upon us. Such a certificate automatically perhaps releases the heads of those institutions from any further worry or investigation, but, have we the right to charge them with a previous knowledge, that the certificate is false.

In the State of Illinois, we have some 75,000 Legionnaires, and the hospitals are necessarily filled with 75% of the personnel non-service connected cases; however, in my superficial investigation, I found that less than 14% might have been able to pay for their own care, and of the 14% in question, 9% had been in various clinics, hospitals, institutions and other groups of medical men in search of their own health, and in questioning them as to the change, it was because of the fine buildings that the government had constructed, of the wonderful equipment that had been placed in them, and of the fine personnel of the hospital, that they have turned to them as a last resort in search of their health.

Therefore, you see that in a measure at least, we ourselves are responsible, and as I see the problem today, it is one for the Medical Commission of the American Legion, State of Illinois, to go forward with the plan to extend the Medical Commission to every state in the Union, so that we may insist on having at least one member of the Medical Commission sitting in as a member of the Rehabilitation Committee, that further by our activity the State Department Commanders shall refer medical problems to the Department Surgeon for consideration before recommendation and adoption. To do this, we must have the co-ordinated help of every veteran in the State of Illinois belonging to this society. At a little gathering in Chicago some time ago, where some 1,500 doctors were eligible to attend, only a handful turned out. Am I to assume that only the minority are interested in the problems that confront us, and, if this be the truth, have we any right to complain? I think those of you who are in a position to do so, should go back to your posts, and feel it your duty to be elected a state delegate to the convention this year, and let us try as medical men to carry through to the National Convention as a majority.

Read before the Veterans Service Committee Dinner, Eighty-fifth Annual Meeting, Illinois State Medical Society, Rockford, May 21, 1935.

LINCOLN'S FAREWELL ADDRESS

Great crowds were gathered at the dedicatory services held at Gettysburg, on Nov. 19, 1863, and about noon Edward Everett began his masterly oration, on which he had been occupied for weeks. It was then President Lincoln's time to address the multitude. With no opportunity, except a few hours before reaching the battlefield on the train, to compose a speech worthy of the momentous occasion, what could he say that had not been said?

Holding in his hands the two pages of manuscript he had written with pen and partly with pencil, President Lincoln delivered the following in less than five minutes. In scarcely 300 words uttered there fell from his inspired lips an address which will go down through all history as being one of the greatest ever recorded:

"Fourscore and seven years ago our fathers brought forth on this continent a new nation, conceived in liberty and dedicated to the proposition that all men are created equal. Now we are engaged in a great civil war, testing whether that nation or any nation so conceived and so dedicated can long endure. We are met on a great battlefield of that war. We have come to dedicate a portion of that field as a final resting place for those who gave up their lives that the nation might live. It is altogether fitting and proper that we should do this. But, in a larger sense, we can not dedicate, we can not consecrate, we can not hallow this ground. The brave men, living and dead, who struggled here

have consecrated it far above our poor power to add or detract. The world will little note nor long remember what we say here, but it can never forget what they did here. It is for us, the living, rather to be dedicated to the great work remaining before us—that from these honored dead we take increased devotion to that cause for which they gave the last full measure of devotion—that we here highly resolve that these dead shall not have died in vain—that this nation, under God, shall have a new birth of freedom—and that government of the people, by the people, for the people, shall not perish from the earth."

Society Proceedings

COOK COUNTY
CHICAGO MEDICAL SOCIETY

Regular Meeting, Wednesday October 23, 1935

What the Medical Profession Can Do to Reduce Automobile Accidents. Frank J. Jirka, Director, Department of Public Health, Springfield, Ill.
Head Injuries. A. Verbrugghan.
Discussion. Harry Jackson.
Spinal Injuries. George G. Davis.
Pelvic Injuries. Wm. R. Cubbins.
Discussion. Carlo S. Scuderi.
Chest and Abdominal Injuries. Roger T. Vaughan.
Discussion—Chest. Ralph B. Bettman.
Abdomen. Raymond W. McNealy.

Regular Meeting, Wednesday, October 30, 1935

First Aid in Eye Injuries. Thomas D. Allen.
Eye Complications of Acute Exanthemata in Children. Richard C. Gamble.
The Recognition of Glaucoma. Harry S. Gradle.
The Diagnosis of Iritis. Sanford R. Gifford.
The Etiology of Iritis. Frank Brawley.
The Treatment of Iritis. Samuel J. Meyer.
The Treatment of Corneal Ulcer. G. Henry Mundt.
Open Discussion.

Personals

Dr. Max Thorek addressed the Chicago Medical Woman's Club on Wednesday, October 9, 1935, on the "Rationale of Electrosurgical Obliteration of the Gall Bladder." (Report of 147 cases).

Dr. E. Lee Dorsett, St. Louis, Mo., addressed the Madison County Medical Society on the subject of "Conservative Treatment of Eclampsia," at Madison, Ill., October 4, 1935.

The Chicago Pathological Society was addressed, October 14, among others, by Dr. Percival Bailey on "Relations of the Pathologist to the Clinic."

Speakers before the Chicago Tuberculosis Society, October 11, were Drs. Frederick Tice and Allan J. Hruby on "Progress in Collapse Therapy."

Dr. Francis N. Orr has resigned from the staff of the Lincoln State School and Colony, Lincoln, after four years' service, to engage in private practice.

Dr. Edward Lee Dorsett, St. Louis, addressed the Madison County Medical Society at Madison, October 4, on "Conservative Treatment of Eclampsia."

Dr. Wendell D. Little, Indianapolis, discussed "Surgical Conditions of the Abdomen," before the Vermilion County Medical Society, Danville, October 1.

Economics was discussed at a meeting of the Chicago Society of Industrial Medicine and Surgery, October 16, by Drs. Felix M. Jansey, Thomas P. Foley and John G. Frost.

Speakers before the Chicago Neurological Society, October 17, included Drs. Isidore Finkelman and William Mary Stephens, Elgin, Ill., on "Heat Regulation in Chronic Encephalitis."

The staff of the Sarah Morris Hospital for Children of the Michael Reese Hospital presented the program of a clinical meeting before the Chicago Pediatric Society, October 15.

Dr. Jacob P. Greenhill has been elected head of the department of obstetrics at the American Hospital of Chicago.

Dr. Leo M. Czaja has been appointed general superintendent of the Municipal Tuberculosis Sanitarium.

At a meeting of the Chicago Society of Allergy, October 21, Dr. Samuel M. Feinberg discussed "A Study of Molds and Their Relation to Allergic Diseases," and Dr. Francis L. Foran opened a discussion on the 1935 hay fever season.

Dr. Frank D. Dickson, Kansas City, Mo., discussed "Low Back Pain with Particular Reference to the Part Played by Congenital Abnormalities," before the Chicago Orthapaedic Society, October 11. Dr. Hershel I. Smith spoke on "Osteitis Fibrosa Cystica."

A symposium on embryology of the female pelvis in its relation to gynecology and obstetrics was presented before the Chicago Gynecological Society, October 18; participants were Leslie B. Arey, Ph.D., Dr. Otto F. Kampmeier and Dr. Arthur K. Koff.

Dr. Olin West, General Manager and Secre-

tary of the American Medical Association, Chicago, addressed the DeWitt County Medical Society, Clinton, September 23, and was guest of honor at a dinner.

Included among promotions recently announced at Loyola University School of Medicine are those of Dr. Morris A. Glatt from clinical associate to assistant clinical professor of otorhinolaryngology, and Dr. Jacob P. Greenhill from associate clinical professor to clinical professor of gynecology.

Dr. Ernst A. Pohle, Madison, Wis., discussed "Roentgen Therapy in Leukemia, Hodgkins and Allied Diseases with Special Consideration of General Body Exposure," before the Chicago Roentgen Society, October 10. Dr. Richard H. Jaffe spoke on "Bone Changes in Leukemia."

Dr. Arthur L. Tatum, professor of pharmacology, University of Wisconsin Medical School, Madison, discussed "Studies in Specific Arsenical Chemotherapy," October 25, before a joint meeting of the Institute of Medicine and the Chicago Society of Internal Medicine.

The St. Clair County Medical Society was addressed, October 2, in Belleville by Dr. T. Wistar White, St. Louis, on "Prevention and Treatment of Certain Communicable Diseases," and in East St. Louis, October 3, by Dr. Charles B. Reed, Chicago, on "Questions Facing Medicine Today."

At a meeting of the La Salle County Medical Society at Ottawa, September 26, speakers were Drs. Edward L. Cornell, Chicago, on "Fundamentals of Obstetrics"; Charles E. Galloway, Evanston, "Timely Pointers on Obstetrical Delivery"; and Irving F. Stein, Chicago, "Lipiodol as an Aid in Gynecologic Diagnosis."

Dr. Gatewood addressed the members of Will-Grundy County Medical Society, October 2 on the subject "New Lamps for Old."

Frederick R. Schmidt addressed the Bureau County Medical Society, October 1, subject, "Nutrition and Skin Diseases."

W. A. Newman Dorland addressed the Bureau County Medical Society, October 1, subject, "The Origin of Ovarian Tumors."

J. P. Greenhill gave a paper on "Recent Progress in Obstetrics," before the members of Sangamon County Medical Society at Springfield, October 3.

Aaron Arkin gave a paper on "Present Knowledge of Blood Dycrasias" before Will-Grundy County Medical Society, October 16.

Hugo B. Rony addressed McHenry County Medical Society, October 17, on "Common Forms of Minor Endocrine Disturbances."

Herman L. Kretschmer presented a paper on "Prostatic Obstruction from the Life Insurance Point of View," at the Annual Convention of the Association of Life Insurance Medical Directors at the Waldorf-Astria in New York City on October 17.

Perry J. Melnick, former Chief Resident Pathologist at the Cook County Hospital, has been appointed Pathologist to the Springfield Hospital, Springfield, Illinois.

George deTarnowsky gave a paper on "Acute Abdominal Surgery," before the Will-Grundy County Medical Society, October 23.

James H. Hutton spoke on "Response of Essential Hypertension to Light Doses of X-Ray," at the meeting of the Mississippi Valley Medical Society at Quincy, Ill., on October 4. On October 5 Dr. Hutton addressed the Pennsylvania Railroad surgeons in Chicago on the same subject.

Robert A. Black gave a paper on "Rheumatism," before the members of Will-Grundy County Medical Society, October 9.

Cleveland J. White addressed the Fox River Valley Medical Association at Fond du Lac, Wis., on October 12 on the subject, "Treatment of Acne-Form Eruptions of the Face."

Harry L. Huber was guest speaker at the Michigan State Medical Society at Sault Ste. Marie, on September 25. His subject was "Allergy and the General Practitioner." While there he gave a paper on "Allergic and Non-Allergic Rhinitis," before the Michigan State Ophthalmological and Otolaryngological Society.

News Notes

—Lead fumes from a kitchen stove where storage battery casings were being burned as fuel caused the death of two children and the serious illness of five others in a family of eleven persons, the Chicago Tribune reported October 20.

—Dr. Richard Jaffe opened a series of pathologic conferences at the Cook County morgue, October 18, on current material from the chil-

dren's department of Cook County Hospital. Conferences are scheduled for November 15, December 13, January 10, February 7, March 6, April 3, May 1 and May 29.

—Members of Illinois State Medical Society are cordially invited to attend these lectures.

—The Iroquois Memorial Hospital was opened October 17, as a branch of the Municipal Tuberculosis Sanitarium; it will be devoted exclusively to collapse therapy of tuberculosis. The hospital which has been closed since January 1 for lack of funds, was built in 1910 as a memorial to those persons who died in the Iroquois Theater fire in December, 1903.

—Fred Conrad Koch, Ph.D., professor of physiological chemistry and chairman of the department of physiological chemistry and pharmacology, University of Chicago, delivered the seventh annual William T. Belfield Lecture before the Chicago Urological Society at the Palmer House, October 24, on "The Biochemistry and Physiological Significance of the Male Sex Hormones."

—Solicitation of funds for beneficiaries of the Veterans' Administration through "liberty balls" and similar affairs has not been authorized, according to a statement from Dr. Thomas Hugh Scott, manager of the veterans' facility at Hines. This announcement was made so that the public may not be misled and induced by false representation to respond to telephone solicitation for the sale of tickets to affairs purporting to be for the benefit of "crippled soldiers" who are patients in the Hines institution.

—The Chicago Woman's Club, through its cancer research committee, offer a series of talks on cancer on five consecutive Thursday mornings, beginning October 24. The course is intended particularly for lay women, it was stated. Dr. Frank L. Rector, Evanston, Ill., field representative, American Society for the Control of Cancer, presented the first lecture on "The Story of Cancer." Other speakers will be:

—Dr. James P. Simonds, professor of pathology, Northwestern University School of Medicine, October 31, "Scientific Aspects of Cancer."

—Maud Slye, director, cancer laboratory, Otho S. A. Sprague Memorial Institute, University of Chicago, November 7, "Transmission of Cancer Through Inheritance."

—Dr. Fred L. Adair, professor and chairman of the department of obstetrics and gynecology, University of Chicago, "Cancer of Female Structures."

—Dr. Max Cutler, director, tumor clinic, Michael Reese Hospital, "Cancer of the Breast."

—Dr. Joseph C. Beck, associate professor of laryngology, rhinology and otology, emeritus, University of Illinois College of Medicine, was guest of honor at a dinner marking his sixty-fifth birthday and the completion of thirty-five years in the practice of medicine, September 26, at the Lake Shore Athletic Club. About 200 persons attended the dinner, which was given by friends and former students of Dr. Beck. Dr. Frank J. Novak Jr. presided; the speakers included Drs. Harry W. Woodruff, Joliet; Ralph A. Fenton, Portland, Ore.; William P. Wherry, Omaha; Burt R. Shurly, Detroit; Samuel J. Kopetzky, New York; Samuel Iglauer, Cincinnati; Otto Joachim, New Orleans, and Louis Ostrom, Rock Island. Dr. Beck graduated from the University of Illinois College of Medicine in 1895. He is a past president of the American Academy of Ophthalmology and Otolaryngology and was chairman of the Section on Laryngology, Otology and Rhinology of the American Medical Association in 1919-1920.

—The Chicago Institute for Psychoanalysis announces a special course for physicians engaged in research work on psychogenic organic disturbances. The course opened October 1, with a lecture by Dr. Walter L. Palmer, of the University of Chicago, on "Physiology and Clinical Pathology of Peptic Ulcer, Ulcerative Colitis, and Functional Bowel Disturbances." Dr. Palmer spoke October 8 and October 15. Other lecturers in the series are:

Dr. Ralph W. Gerard, University of Chicago, October 15, 22, 29; Recent Progress in the Physiology of the Nervous System (Action Potentials, Thalamus and Vegetative System).

Dr. Ben Z. Rappaport, University of Illinois, October 22, 29, November 5; Allergy and Bronchial Asthma.

Dr. Roy R. Grinker, University of Chicago, November 5, 12, 19; Clinical Pathology and Theory of the Epilepsies.

Broda O. Barnes, Ph.D., University of Chicago, November 26, December 3; Physiology of the Endocrine Glands.

Dr. Solomon Strouse, Rush Medical College, December 10, 17; Clinical Pathology of Endocrine Disturbances.

Dr. M. Herbert Barker, Passavant Hospital, January 7, 14; Physiology and Clinical Pathology of Essential Hypertension.

Dr. Erwin P. Zeisler, Northwestern University, January 21, 28; Clinical Pathology of Eczema and Urticaria.

Deaths

ALDEN ALGUIRE, Belvidere, Ill.; Rush Medical College, Chicago, 1897; a Fellow, A. M. A.; member of the Radiological Society of North America; past president of the Boone County Medical Society; aged 70; died, August 23.

WERNER LOTHAR BENISHEK, Aurora, Ill.; Albert-Ludwigs-Universität Medizinische Fakultät, Freiburg, Baden, Germany, 1926; a Fellow, A. M. A.; director of the x-ray department of the Copley Hospital; aged 33; was found dead, September 30, or poison, self-administered.

SVENNING DAHL, Chicago; College of Physicians and Surgeons of Chicago, 1890; member of the Illinois State Medical Society; formerly on the staff of the Norwegian-American Hospital; on the staff of the Lutheran Deaconess Hospital; aged 78; died, August 18, of chronic myocarditis and arterio-sclerosis.

M. P. LYLA HARKER, Oak Park, Ill.; Loyola University School of Medicine, Chicago, 1923; aged 48; died suddenly, July 27, of cerebral hemorrhage.

WILLIAM JAMES HICKSON, Chicago; University of Pennsylvania Department of Medicine, Philadelphia, 1900; a Fellow, A. M. A.; director of the medical research department, Training School, Vineland, N. J., 1912-1915; psychopathologist to the psychopathic laboratory of the Municipal Court of Chicago, 1914-1929; aged 61; died, October 4, of heart disease, while at his summer home in Gloucester, Mass.

JAMES CHARLES HOLDSWORTH, Chicago; College of Physicians and Surgeons, Baltimore, 1896; served during the World War; aged 64; died, August 17, in the Veterans Administration Facility, Hines, Ill., of subacute bacterial endocarditis.

HARVEY LOUIS LANGLOIS, Kankakee, Ill.; University of Illinois College of Medicine, Chicago, 1917; a Fellow, A. M. A.; aged 44, on the staff of St. Mary Hospital, where he died, August 22, of pneumonia.

VERGIL ALVIN ROSS, Champaign, Ill.; Rush Medical College, Chicago, 1917; a Fellow, A. M. A.; served during the World War; assistant health officer and senior medical adviser to men at the University of Illinois; aged 42; was found dead in bed, August 26, of coronary thrombosis.

GEORGE FREDERICK STERICKER, Springfield, Ill.; University of Leeds School of Medicine, and M.R.C.S., England, 1883; L.M.S.S.A., London, 1884; a Fellow, A. M. A.; for many years president of the Springfield Tuberculosis Association; on the staffs of St. John's Hospital and the Springfield Hospital; aged 73; died, September 14 of subacute bacterial endocarditis.

THOMAS W. TOLER, Astoria, Ill.; Northwestern University Medical School, Chicago, 1892; aged 64; died, July 10, in the Peoria (Ill.) State Hospital, of bronchopneumonia, following a fracture of an arm received in a fall and burns incurred the following day.

WILLIAM HAMLIN WILDER, professor emeritus of ophthalmology at Rush Medical College, died at his home in Chicago, September 24, of cerebral arterio sclerosis and paralysis agitans, aged 74. Dr. Wilder was born in Covington, Ky., and received his early education at Farmers College, College Hill, Ohio. He received the B.A. degree at Belmont College in 1878 and his medical degree from the Medical College of Ohio, Cincinnati, in 1884. He also pursued postgraduate study in the University of Göttingen in 1889 and the University of Vienna in 1890. He began the practice of medicine in Cincinnati in 1884 and removed to Chicago in 1892. In 1907 he became professor of ophthalmology at Rush Medical College and was made professor emeritus in 1926. He served as honorary surgeon to the Illinois Eye and Ear Infirmary and as ophthalmologist to the Presbyterian Hospital. He was chairman of the Section on Ophthalmology of the American Medical Association in 1907-1908 and a member of the House of Delegates during 1926, 1927, 1928, 1930 and 1931. He was a member and also president in 1931 of the American Academy of Ophthalmology and Otolaryngology; member of the American Ophthalmology Society and president in 1918; member and vice president of the Illinois Society for the Prevention of Blindness, and fellow of the American College of Surgeons. In May 1935 Dr. Wilder was awarded the ninth annual Leslie Dana Gold Medal, given by the St. Louis Society for the Prevention of Blindness for outstanding contributions in the preservation of sight. During the World War Dr. Wilder served as a major in the Medical Reserve Corps. Dr. and Mrs. William H. Wilder established recently the William H. Wilder Fellowship in neurology in memory of one of their sons. Another son, Dr. Russell Morse Wilder, is a member of the staff of the Mayo Clinic. Dr. Wilder contributed notably to preventive medicine in the field of ophthalmology, his most significant efforts concerning trachoma, ophthalmia neonatorum and the rehabilitation of the blind. He also worked assiduously in the promotion of higher standards in ophthalmologic practice, and he was instrumental in the establishment of the American Board of Ophthalmology, giving this organization years of service as secretary.

HERBERT ARTHUR WILDMAN, Sterling, Ill.; Rush Medical College, Chicago, 1926; a Fellow A. M. A.; on the staff of the Public Hospital; aged 39; died, September 22, as the result of an automobile accident.

MAX DARIUS WILSON, Chicago; Bennett Medical College, Chicago, 1912; a Fellow, A. M. A.; aged 62; died, October 6, in the Jackson Park Hospital, of carcinoma of the colon with metastasis.